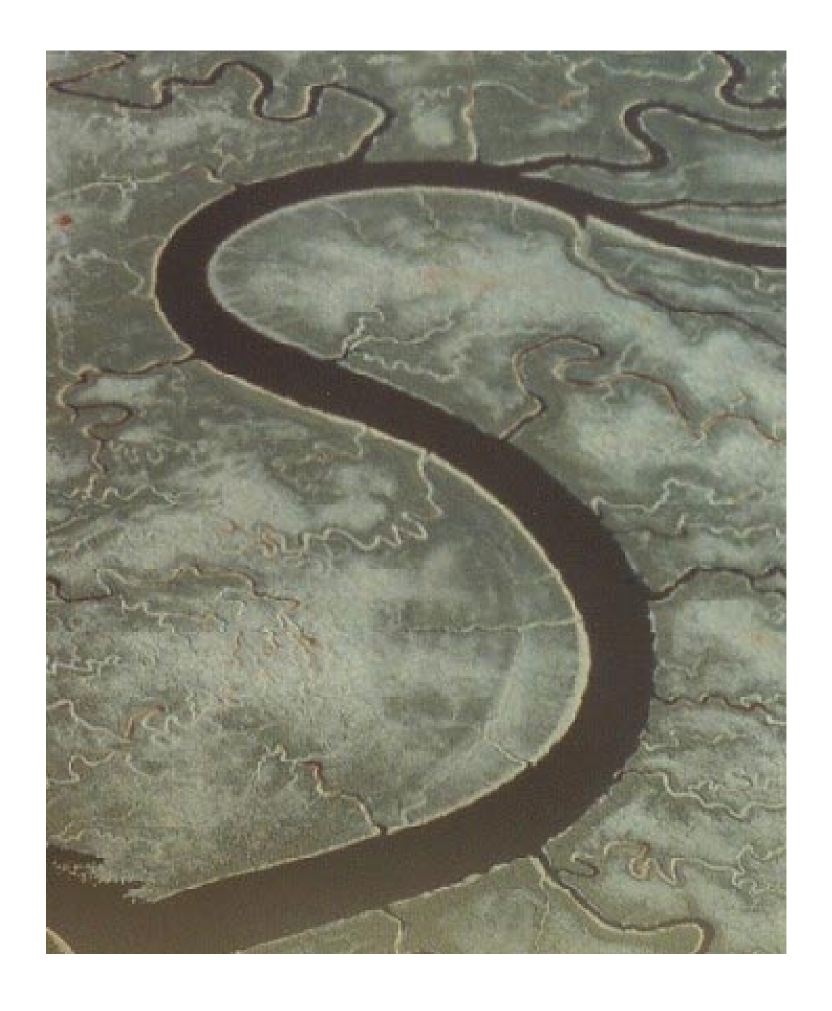


# Where Semantics Meets Pragmatics

First International Workshop on Current Research
in the Semantics-Pragmatics Interface
Michigan State University, July, 11-13, 2003

during the Summer Institute 2003 of the Linguistic Society of America

organized by

Klaus von Heusinger, Jaroslav Peregrin and Ken Turner

http://ling.uni-konstanz.de/SemPrag2003/

## Description

The purpose of this workshop is to attract very high quality recent work on the interdigitation of semantic and pragmatic theories. This topic has become a centre of intense interest in the last year or so and a book series called Current Research in the Semantics-Pragmatics Interface (CRiSPI) of which the three organizers of this workshop are editors or editorial advisors, may have played some role in promoting this interest. The workshop is interested in attracting papers on the currently fashionable topics of, among others, presupposition, anaphora resolution, quantification, propositional attitude attribution and modality, as well as other less recently fashionable topics such as conditionals. Logical, linguistic, psycholinguistic and computational approaches to these topics will be welcomed. We hope that each invited speaker will be able to have a one hour slot, and the other speakers will have 40 minutes (including discussion). Selected papers may be published as a CRiSPI volume provisionally titled 'Where Semantics Meets Pragmatics: The Michigan Papers' (http://www.elsevier.com/locate/series/crispi)

## Programme

**Friday, 11 - July - 2003**

| | | |
|---|---|---|
| 14.00 | | Registration (fee 25 US $) at B-106 Wells Hall |
| 15.00-15.15 | | *Opening* |
| 15.15-16.15 | Larry Horn (Yale University) | The Border Wars: a neo-Gricean perspective |
| 16.15-16.30 | | *break* |
| 16.30-17.10 | Mira Ariel (Tel Aviv University) | *Most*: Reversing some of the roles of semantics and pragmatics |
| 17.10-17.50 | Lewis Bott & Ira Noveck (CNRS Bron) | The Time Course of Scalar Implicature |
| 17.50-18.10 | | *break* |
| 18.10-18.50 | K.M. Jaszczolt (University of Cambridge) | Futurity in Default Semantics |
| 18.50-19.30 | Michael Hegarty (Louisiana State University) | Type Shifting of Entities in Discourse |
| 20.00 | | *party or dinner* |

**Saturday, 12 - July - 2003**

| | | |
|---|---|---|
| 9.00-10.00 | Hans Kamp (Universität Stuttgart) | tba |
| 10.00-10.30 | | *break* |
| 10.30-11.10 | Javier Gutiérrez-Rexach (Ohio State University) | Superlative Quantifiers and the Dynamics of Context Dependence |
| 11.10-11.50 | Linton Wang, Eric McCready & Nicolas Asher (University of Texas) | Information Dependency in Quantificational Subordination |
| 11.50-12.30 | Ronnie Cann (University of Edinburgh) | Semantic Underspecifictaion and the Pragmatic Interpretation of *Be* |
| 12.30-14.00 | | *lunch* |
| 14.00-14.40 | Ariel Cohen (Ben-Gurion University) | How to deny a presupposition |
| 14.40-15.20 | Jeremy J. Goard (UC Davis) | Definiteness and English Prenominal Possessives |
| 15.20-16.00 | Chungmin Lee (Seoul National University) | How Alternative Question and Conjunctive Question Generate Contrastive Focus and Contrastive Topic, respectively |
| 16.00-16.20 | | *break* |
| 16.20-17.00 | Luis Paris (State University of New York) | On the properties of a Semantics-Pragmatics Interface Pattern in the Expression of Manner |
| 17.00-17.40 | Ring Mei-Han Low (University at Buffalo) | The Hidden Path of Semantic Content within Pragmatic Context: The definite article, "the" |
| 17.40-18.20 | Markus Egg (Universität des Saarlandes) | Metonymy at the semantics-pragmatics interface |
| 18.20-18.40 | | *break* |
| 18.40-19.40 | Nicolas Asher (University of Texas) | Discourse Topics |
| 20.30 | | *dinner or party* |

**Sunday, 13 - July - 2003**

| | | |
|---|---|---|
| 9.00-9.40 | Hotze Rullman & Aili You (University of Calgary) | General Number and the Semantics and Pragmatics of Indefinite Bare Nouns in Mandarin Chinese |
| 9.40-10.20 | Daniel Hole (University of Munich) | Matching the Constituency of Quantification and Sentence Structure: Two Case Studies from Mandarin Chinese |
| 10.20-10.40 | | *break* |
| 10.40-11.20 | Richard Brehen (University of Cambridge) | On pragmatic intrusion into semantic content |
| 11.20-12.00 | Mayumi Masuko (ICU Tokyo) | Referential Expressions and Syntax-Semantics(-Pragmatics) Interface |
| 12.00-12.20 | | *break* |
| 12.20-13.20 | William Ladusaw (UC Santa Cruz) | Framing the issue: the biasing effect of polarity items in questions |
| 13.20-13.30 | | *Closing word* |

**Alternates**

| | |
|---|---|
| António Branco (Universidade de Lisboa) | Nominals are Doubly Dual |
| Aoife Ahern (U.N.E.D. Madrid) | Mood, Propositional Attitudes and Metarepresentation in Spanish M |

**Accepted Papers**

| | |
|---|---|
| Yael Greenberg (Bar-Ilan University) | Tolerating exceptions with "descriptive" and "in virtue of" generics: two types of modality and reduced vagueness |

# MOOD, PROPOSITIONAL ATTITUDES AND METAREPRESENTATION IN SPANISH

Aoife Ahern, U.N.E.D. aahern@bec.uned.es

Abstract for the International Workshop "Where Semantics Meets Pragmatics"
Michigan State University, July, 11-13, 2003

In this paper I will be considering how the data related to the lexical selection of the indicative and subjunctive moods in Spanish subordinate clauses reflect aspects of the interaction between semantics and pragmatics. My proposal consists of a Relevance-theoretically based analysis of the Spanish subjunctive as a grammatical marker of the meta-representation of propositions, which affects, ***inter alia***, the interpretively expressed propositions functioning as objects of certain propositional attitude predicates. This basic, procedural semantic content of the subjunctive activates a variety of pragmatic assumptions during the interpretation process which correspond to the diverse communicative purposes that are often mentioned in the explanations found in traditional grammars of the “meaning” of mood selection and choice in Spanish.

***That***-clauses have been analysed (Bezuidenhout (2000)) as encoding the procedural information that they express propositions which bear a relation of interpretive resemblance to the content of the object of a propositional attitude predicate (OPA). The notion of interpretive use, as described by Sperber and Wilson (1995: 228) consists of the use of utterances to represent, not what they describe, but what they resemble. This resemblance relation consists of the propositions involved sharing some logical properties and giving rise to partly identical contextual implications. Interpretive use, thus, is a particular kind of metarepresentation: the proposition consists of a representation that ***resembles*** some other representation (for instance, the speaker’s own (possible/previous) thought, or a thought or utterance the speaker attributes to some other contextually salient individual) which it is being used to represent.

A noteworthy property of propositional attitude predicates in the Romance languages is that certain semantically related groups of them select subjunctive arguments. In Spanish, for instance, these include predicates such as volitional ones (***querer***, ***ordenar***, ***pedir - want, command, request***), those known as evaluatives or factive-emotives (***lamentar, temerse, asustar – regret, fear, frighten),*** negative epistemics (***dudar, negar – doubt, deny***), as well as other sentence-embedding predicates like those expressing probability and necessity (***necesitar***, ***ser probable que – need, be probable that***). I would like to suggest that, in accordance with Bezuidenhout’s analysis of the clauses embedded under propositional attitude predicates as interpretive representations, lexical selection of the subjunctive reflects that these interpretively used propositions are expressed under an additional layer of metarepresentation.

Therefore, in utterances such as:

1) ***María quiere que coloquemos sus zapatillas al lado del sillón.***
   María wants that we-put (pres. subj.) her slippers beside the armchair.

2) ***Lamentaron que tuvieras que repetir el examen***.
   They-regretted that you-had (imperf. subj.) to-repeat the exam.

the lexical selection of the subjunctive reflects the fact that the propositional attitudes represented by predicates such as ***querer*** and ***lamentar*** can be described as doubly interpretive. Firstly, they are interpretive by virtue of the fact that they are presented by the speaker as propositions that resemble, in contextually appropriate ways, the actual OPA as entertained by the subject. In other words, the speaker of (1) shows her intention, by way of this utterance, that the embedded clause

***que coloquemos sus zapatillas al lado del sillón*** should interpretively represent the proposition María herself entertains (as a representation of the state of affairs which is the object of her wanting). On the other hand, the nature of the type of propositional attitudes which these subordinating predicates are used to represent entails that the contents of their object propositions is entertained as a metarepresentation by the subjects themselves. This occurs in the case of volitional predicates since they describe a relationship between an agent and a proposition such that the proposition is entertained by the subject as representing a description of a desirable state of affairs, as opposed to a descriptive representation of (what is believed to be) an actual state of affairs. As for factive predicates such as the one found in (2), the lexical semantics of these verbs determines that the proposition expressed by the embedded clause is "presupposed", which, for the present purposes, is equivalent to "already present in the conversational context"; thus they can be considered interpretive in the sense in which all that-clauses are, in addition to being interpretations of representations already present in the context of utterance.

The objects of other groups of propositional attitude and other sentence-embedding predicates in Romance languages, such as belief predicates, "positive" epistemics (i.e., the equivalents of ***know, realise, find out***, etc.), and predicates of perception, are expressed in the indicative mood. The semantic properties of these predicates include the specification that their arguments consist of interpretations of what, according to the speakers point of view (as reflected by the choice of the particular embedding predicate), the agent of the propositional attitude regards as descriptions of (what can be assumed to be actual) states of affairs. Therefore, the interepretive use is carried out only by the speaker, in order to represent what she regards as a proposition that resembles the subject's descriptive representation of the OPA. As a result, the subjunctive is ruled out: there is no further level of metarepresentation beyond the one used by the speaker to represent the agent's belief. In sum, it seems that the selection of mood in argument clauses is directly related to lexical properties of embedding predicates which can be seen as describing either descriptive or interpretive propositional attitudes, although this kind of classification of propositional attitude predicates is certainly in need of further development.

In contrast with previous studies of mood in the Romance languages, for example those of Quer (1998), or Farkas (1992), my proposal is based on the idea that the subjunctive mood encodes procedural information, as described by Blakemore (1987; 2000) and Wilson and Sperber (1993). The communicative role of procedural expressions, as opposed to that of conceptual ones, is to activate contextual assumptions within the cognitive processes of utterance interpretation that belong to the computational, rather than the representational, aspects of interpretative processes. The analysis of the subjunctive mood as a procedural expression which activates the assumption that the speaker is marking a proposition with an additional layer of metarepresentation will be shown to account for some important facts about the use of this mood, as well as the connection with previously proposed analyses:

- Both traditional as well as recent proposals such as those put forth by Bustos and Aliaga (2002), Gregory (2001), Villalta (2000), and Quer (1998) share the underlying intuition of the subjunctive as a mark of speaker "distancing". This can be shown to be a result of the implicatures that tend to arise as a result of the expression of a proposition as a ***meta-interpretive*** use.

- The notion of the subjunctive as a mark of an **additional** layer of meta-representation itself explains the fact that this mood only appears in subordinate clauses and (polite) imperative utterances. The dependence on a primary metarepresentational context is the pragmatic construal of the traditional ***subjunctive as dependent mood*** idea.

- The often mentioned, though poorly described, interaction between mood and modality can be shown to be a result of the relationships which both of these semantic domains maintain with metarepresentational uses of propositions.

# *Most*: Reversing some of the roles of semantics and pragmatics

**Mira Ariel, Tel Aviv University**

Since Horn 1972, semanticists and pragmatists alike have assumed only a lower-bounded lexical meaning for scalar quantifiers such as *most* ( more than half ), relegating to pragmatics the common bilateral meaning ( more than half but not all ). Thus, compatibility with all is semantically accounted for, whereas the common upper bound is pragmatically inferred. In this talk I will first argue that pragmatic explanations cannot provide the upper bound for *most*, and second, that it is the semantics of *most* which is responsible for it. The result is a partial reversal in the roles of semantics and pragmatics: Compatibility with all is inferred, and the upper bound is semantically accounted for.

Based primarily on The Santa Barbara Corpus of Spoken American English and the London-Lund Corpus of Spoken British English (127 examples), I will first argue that not all is not a frequent implicature in actual discourse. Consider (1):

1. a. **MOST** UCSB students have 0...1...2...3 or 4 drinks per week (Anti-drinking ad, 2.02).
   b. **Most** (Israelis) decided for peace. Me too (Originally Hebrew sticker, 4.02)

While the writers of (1) are probably not committed to all , it is unreasonable to attribute to them an actual **intention** to implicate not all (conversational implicatures are intended meanings according to Grice 1975). The reason is that the writers intend the addressee to draw some conclusion based only on the majority reference set: You too should drink up to 4 drinks.../decide for peace . Generating the not all implicature ( Not all UCSB students drink up to 4 drinks... , Not all decided for peace ) may actually encourage the addressee to follow the example set by the minority (and e.g., drink more than 4 drinks...). This would defeat the writers purpose, so attributing to them an intention to communicate an interpretation that works against the generalization they are relying on in their argument is an unreasonable theoretical step (see also Levinson 2000 for the role of speaker goals in canceling implicatures).

Now, implicatures must be relevant (see Horn 1984, Matsumoto 1995, Levinson 2000). The received view can correctly reason that not all are irrelevant in (1 ), and hence, not generated. Still, despite the lack of implicature, the interpretation of *most* is upper bounded here. Corpora searches reveal that (1) exemplify the common *most* case (74%[1]). This means that scalar implicatures cannot account for the common bilateral interpretation of *most*.

Laurence Horn (p.c.) then proposes to justify the implicature view as follows: Despite the fact that the scalar implicature works contra the speaker s goals, she does intend to convey it, in order to obey the Maxim of Quality. Although all would have made her case stronger, since she s not in a position to commit to all , she is obliged to concede that not all . If this is true, we will have to assume that speakers routinely generate forced implicatures, an unwelcome conclusion. Fred Landman (2000, p.c.) also proposes to maintain the received semantic view, but he offers a different extralinguistic explanation for the upper bound. Accepting that scalar implicatures are not routinely generated, he suggests that *most* is rarely interpreted as all simply because the statistical probability for the addressee to interpret *most* as 100% is quite slim. I will first argue against Landman s proposal, and then suggest that we do not need to assume that scalar

[1] The implicature is generated in 17.3% at most. *Most* is not necessarily upper-bounded in 8.7%.

implicatures are  forced  implicatures. The reason is that an upper bound is provided by the semantics.

In order to argue against Landman s proposal, I administered questionnaires about (Hebrew) *most* and *more than half* (Ariel in press). Note that according to the received view, these two expressions should not differ semantically, although they might differ pragmatically. Indeed, they do. *More than half* is associated more strongly with smaller majorities than *most*, and *most* is more strongly associated with larger majorities. For example, the values 51%, 60% and 75% were confirmed by 72.1% of the subjects for *most*, but by 95.2% of the subjects for *more than half*. Conversely, 84.4% of the subjects selected 90% for *most*, but only 52.6% did so for *more than half*. Contra Landman, these skewed findings demonstrate that pure probabilities cannot account for the interpretation of *most*, then. Another pragmatic explanation readily suggests itself, however: Whereas *more than half* is oriented towards the half point, *most* connotes a significant quantity (which can be traced to its etymological source in both languages). This pragmatic analysis can account for the following example:

2. **Most** of the ladies and **more than half** of the gentlemen wore evening clothes
(Sinclair Lewis, *It can t happen here*, McCawley's example 14.1.5, p. 427).

As McCawley 1981: 427 explains, this quote  strongly suggests that a greater proportion of ladies than of gentlemen were dressed in evening clothes .

However, the pragmatic explanation cannot account for the seemingly puzzling fact that preferences are reversed once 100% is the target value. According to the pragmatic tendencies above, we should expect a higher acceptance rate of 100% for *most* than for *more than half*, because, *most* is associated with higher majorities than *more than half* is. According to Landman, an equal and very low acceptance of 100% is predicted for both expressions, and I believe that the same prediction holds for the implicature analyses.[2] Table 1 presents the results from 3 questions concerning 100% and the minimally lower 99%:[3]

| | **100%** | **99%** |
|---|---|---|
| ***Most*** | 6/96=6.25% | 80/96=83.3% |
| ***More than half*** | 21/56=37.5% | 37/56=66.1% |

**Table 1: 99% and 100% as options for *most* and *more than half***

First, note that the pragmatic tendency observed above is maintained up to the 99% level, *most* receiving 26% more confirmations for 99%. Second, almost two thirds of the subjects did not select 100% as a potential value for *more than half* (62.5%). Both results are compatible with pragmatic explanations. The same pattern should have emerged for *most*, but it didn t. Practically all responses avoided 100% for *most* (93.75%). While the ratio between 99% and 100% for *more than half* is 1.75 (times more 99%), the counterpart ratio for *most* is 13.3 (times more 99%). The gap here for *most* is 7.4 times larger than that for *more than half*.

[2] Researchers do not discuss *more than half*, but it stands to reason that it too should trigger the not all  implicature according to the received view.

[3] In order to help subjects suppress their pragmatic tendencies in this questionnaire in general, I asked them to circle as many answers as they thought possible, even if they found them implausible. In addition, in one of the three questions about 99% and 100%, I substituted *more than half* and *most* with *a lot more than half* and *an overwhelming majority*.

In fact, Table 2 shows that the 93.75% ban on 100% on *most* should count as categorical, for it s actually stronger than the ban on 49% and 50% (for *most*):

| | **49%** | **50%** | **51%** |
|---|---|---|---|
| ***Most*** | 3/32=9.4% | 7/64=10.9% | 47/64=73.4% |
| ***More than half*** | 1/19=5.3% | 3/38=7.9% | 35/38=92.1% |

**Table 2: Acceptance of 49%, 50% and 51% values for *most* and *more than half***

A comparison between the two tables shows that subjects accepted 49% and 50% 1.5 and 1.7 times more (respectively) than they accepted 100% for *most.* If we wish to maintain the semantic status of the lower bound (51%), as we should (see the very large gap between the acceptance rates for 50% and 51% for both expressions), the conclusion must be that the same status should be attributed to the upper bound for *most*. Note that if anything, subjects find the upper bound harder to cross than the lower bound for *most*. Whereas the 50%/51% acceptance ratio is 6.7 in favor of 51%, the 99%/100% acceptance ratio is twice that, 13.3, in favor of 99%.

I therefore propose that what pragmatics cannot deliver (relevant implicatures), or should not deliver (irrelevant forced implicatures), semantics must. I suggest that *most* carries an upper (in addition to a lower) bounded lexical meaning, namely, that the quantity denoted by *most* is more than half and less than all (translating into 50% plus something up to 100% minus something). Evidence for the upper-bounded meaning of *most* other than the corpus data and the assessment questions comes from wise-guy interpretations and from discourse anaphora patterns. Wise-guy interpretations (Ariel 2002), are contextually **in**appropriate interpretations which can be insisted upon. Such insistence is successful only if the inappropriate meaning is semantic rather than pragmatic. Note the following adapted example (the original, Hebrew example centers around the numbers):

3. A couple offered to sell four CD s because they needed 100 sheqels to repair their CD player. The store manager offered the couple 40 sheqels. The guy said that in the store across the street he can get **most** of the repair money. The store manager said that not on his life will he get **that**. They took a bet... The guy... sold the CDs and got **100 sheqels**. He took a receipt and went back. Sorry, said the manager, you lost. I said you won t get **most of the repair money**, and indeed, you did not get **it**. I got more, explained the astonished Kibbutznik, but the sales woman laughed in his face".

Since the manager can insist on the inappropriate upper bounded most in a context where at least most is called for, upper-bounded most is a legitimate wise-guy interpretation, and must form part of *most* s lexical meaning. Note that an attempt to insist on an at least most interpretation when an upper-bounded most is called for is not as successful:

4. Income tax clerk: In how many of the past ten years did you fail to file your tax return?
   Tax payer: **Most** years.
   Income tax clerk: Our information shows that you failed to file in **all** those years.
   Tax payer: ?? That s what I meant. **At least most**, and possibly **all** the years!

If it can t be a successful wise-guy interpretation, at least most must not constitute *most* s lexical meaning.

Next, another set of questions on the questionnaire tested subjects about the interpretations of *most* and numbers as antecedents. Results here show that *most* behaves just like the numbers

regarding the upper bound. Since the numbers are now taken as semantically bilateral (see Geurts 1998 and references cited therein), I argue that so should *most.* Based on Kadmon s observation that *at least n* (e.g., *at least 11 kids*) can provide a unique antecedent for a later *they* referring to at least n kids , but *n* (e.g., *11 kids*) cannot serve as an antecedent for such an at least n anaphoric interpretation, Fred Landman (p.c.) predicts that if *most* is lexically specified for more than half it should pattern with *at least n* antecedents, and not with *n* antecedents. In other words, unlike the numbers, *most* should be able to provide a unique antecedent for a *they* referring to all ( at least most ). Still, results show that *most* patterns with unmodified number antecedents.

The questions concerned presented *most* or some number as an antecedent for a later discourse anaphoric *they*. Subjects were told that reality is such that all (for *most*) or a higher number (for the number antecedent) was the case for the antecedent clause. In the relevant questions, the context was such that subjects could view the anaphoric set as possibly distinct from the antecedent set. Here is one such case:

5. Ruti told me that **most** of the teachers are interested in changing the school principal in Karmiel. **They** even signed a petition against him, which was sent to the Minister of Education , she added.
   **Question**: It became apparent that **all** the school teachers are interested in changing the principal. Who are those that Ruti meant that **They** even signed a petition against him, which was sent to the Minister of Education ?
   **Answers**: A. Between 51% and 99% of the school teachers
   Or:
   B. 100% of the school teachers
   Or:
   C. Impossible to know.

Thus, in terms of states of affairs in the world, while all the teachers may have been interested in changing the principal, it is not necessarily the case that all signed the petition. One subject (out of 24, 4.2%) said that *They* refers to all (answer B), in line with Landman s prediction. 7/24 (29.2%) chose Answer C, which is what Kadmon predicts for the numbers. Crucially, two thirds of the subjects (16/24) chose most but not all as the intended referent (Answer A). This is clearly contra Landman s prediction. If *most* can denote all and we know that all is the case, the pronoun should have referred to all . But it didn t in most cases. A similar question with a number antecedent produced similar results: 6% chose the higher number, 52% chose impossible to know and 42% chose the antecedent number (see Ariel in press for further details).

For both the numbers and for *most*, then, in a context where subjects could see a potential difference between the antecedent set and the anaphoric set, they interpreted *they* as bilateral n/most . In such cases, I claim, subjects could not be sure that the anaphoric *they* should receive what I consider the enriched (higher value) at least interpretation, so they adhered to the lexical meaning of the antecedent, because it is all they could be confident that the speaker intended. This lexical meaning is equally upper bounded for the numbers and for *most*. Thus, value assessments, wise-guy interpretations and discourse anaphora all attest to a semantic upper bound for *most*.

Now, if we assume that *most* only denotes 51-99%, we must somehow account for the fact that *most* is nonetheless often compatible with all . For this we need to distinguish between the meaning of X and the states of affairs it is compatible with (as proposed by Koenig 1991 for the numbers). Actually, The same is true of *mother*:

6. Benny Avraham, Adi Avitan, Omar Su ad
   **Mother** is waiting at home (Originally Hebrew sticker, 2002).

(6) is compatible with the family (and all of Israel) also waiting for the missing soldiers, which is known to be true. Still, the meaning of *mother* is not analyzed as at least mother, and possibly the family . The writers are only committed to mother & upper-bounded most in ( 6) & (1). The propositions they express are nonetheless compatible with a reality in which the family / all is true.

While I suggest that *most* codes a range with both lower and upper bounds, crucially, this meaning is silent about the complement of *most*, and specifically on whether the predicate holds for the complement. Unlike the upper bound assumed by received views (of whatever version), it does not entail not all are x . If so, since our world knowledge tells us that parts (as most is) are often compatible with states of affairs in which wholes ( all ) hold, the received view assumption of the compatibility of *most* with all is accounted for, though inferentially so. This analysis echoes Kadmon s 1987 analysis of the numbers, which she views as lexically bilateral, though compatible with there being additional entities bearing the same property outside the set.

All in all, I propose to shift some of the semantic burden of *most* to inferential processes (compatibility with all ), and some of the pragmatic burden to lexical semantics (a weaker version of the upper bound). In addition, however, (pragmatic) implicatures are still responsible for classical pragmatic phenomena: The generation of strong not all implicatures in a minority of cases where these are intended by the speaker (not here exemplified), as well as for the understanding that the quantity denoted by *most* is significant.

**References**


Ariel, Mira. 2002. Privileged interactional interpretations. *Journal of Pragmatics* 34: 8. 1003-44.

--- in press. Does *most* mean more than half ? *BLS* 29.

Geurts, Bart. 1998. Scalars. in P. Ludewig & B. Geurts (eds.) *Lexikalische Semantik aus kognitiver Sicht*, 95-117. T bingen: Gunter Narr Verlag.

Grice, Paul H 1975. Logic and conversation. In P Cole and J L Morgan eds. *Syntax and semantics 3: Speech acts*. New-York: Academic Press. 41-58.

Horn, Laurence R. 1972. *On the semantic properties of logical operators in English*. Mimeo, Indiana University Linguistics Club, Bloomington, IN.

--- 1984. A new taxonomy for pragmatic inference: Q-based and R-based implicatures. In D Schiffrin (ed.). *Meaning, form and use in context: Linguistic applications* (GURT 84). Washington, DC: Georgetown University Press .11-42.

--- 1989. *A natural history of negation*. Chicago: University of Chicago Press.

Kadmon, Nirit. 1987. *On unique and non-unique reference and asymmetric quantification*. Ph.D. dissertation, University of Massachusetts, Amherst. Published 1992. Garland Press.

Koenig, Jean-Pierre. 1991. Scalar predicates and negation: Punctual semantics and interval interpretations. *CLS* 27. 140-55.

Landman, Fred. 2000. *Events and plurality*. Dordrecht: Kluwer.

Levinson, Stephen C. 2000. *Presumptive meanings*: *The theory of generalized conversational implicature*. Cambridge, Mass.: The MIT Press.

Matsumoto, Yo. 1995. The conversational condition on Horn scales. *Linguistics and Philosophy* 18. 21-60.

# Discourse Topics

**Nicholas Asher, UT Austin**

Abstract for the International Workshop "Where Semantics Meets Pragmatics"
Michigan State University, July, 11-13, 2003

In this talk I'll attempt to develop a theory of what discourse topics do in discourse structure and how they are affected by intrasentential properties. I'll begin with Buring's theory of sentence topic and van Kuppelvelt's theory of discourse topic and show how the very nice theory that results from combining their views cannot deliver the kinds of information a theory of discourse interpretation requires from discourse topic. I'll then go on to propose a related but more abstract theory of discoruse topic that is inherently dynamic and combines borth pragmatic and semantic elements.

# The Time Course of Scalar Implicature

**Lewis Bott & Ira A. Noveck**

Abstract for the International Workshop "Where Semantics Meets Pragmatics"
Michigan State University, July, 11-13, 2003

In paper presents an experimental investigation into a class of inference known as *scalar implicatures*. These arise when a less-than-maximally-informative utterance is taken to imply the denial of the more informative proposition (or else to imply a lack of knowledge concerning the more informative one). Consider the following dialogues:

1) Peter: Are Cheryl and Tony coming for dinner?
   Jill: Cheryl or Tony is coming.
2) John: Did you get to meet all of my friends?
   Robyn : Some of them.

In (1), Jill's statement can be taken to mean that *not both* Cheryl and Tony are coming for dinner and, in (2), that Robyn did not meet all of John's friends. These interpretations are the result of scalar implicatures, which we will describe in detail below. Before we do so, note that the responses in each case are -- from a strictly logical point of view -- compatible with the questioner's stronger expectation; if Jill knows that both Cheryl and Tony are coming, her reply is still true and if in fact Robyn did meet all of John's friends, she also spoke truthfully. *Or* is logically compatible with *and* and *some* is logically compatible with *all*.

Such inferences were first classified by Paul Grice as *generalized implicatures*, as he aimed to reconcile logical terms with their non-logical meanings. Grice, who was especially concerned by propositional connectives, reflected on those inferences accompanying logical terms that become, through conversational contexts, part of the speaker's overall meaning. In one prime example, he described how the disjunction *or* has a weak sense, which is compatible with formal logic's (the inclusive-or), but as benefiting from a stronger sense (*but not both*) through conversational uses (which would make the disjunction exclusive). What the disjunction *says*, he argued, is compatible with the weaker sense, but through conversational principles it often *means* the stronger one. Any modern account of the way logical terms are understood in context would not be complete without considering these implicatures.

Scalar implicatures have been discussed at length in the linguistic-pragmatic literature as it has greatly expanded on Grice's original insights. In what follows, we present descriptions of scalar implicature from the point of view of two post-Gricean pragmatic theories that aimed to elaborate on Grice but are now in often in conflict. One approach is often referred to as *neo-Gricean* (Horn, 1973; Levinson 1983, 2000) and the other is known as Relevance Theory (Sperber & Wilson, 1985 1996; Carston, 2002). We will discuss each account of scalar implicature in turn while ultimately focusing on existential quantifiers.

According to neo-Griceans like (Horn, 1973) and Levinson (1983, 2000), the scalars described in (1) and (2) above are paradigmatic cases of implicature that work on *terms* that are relatively weak. The speaker's choice of a weak term implies the rejection of a stronger term from the same scale. For example, the terms *some* and *all* may be viewed as part of a scale (<some, all>), where *all* constitutes the more informative element of the scale (since *all p* entails *some p*). In the event that a speaker chooses to utter *some* the hearer will take it as suggesting that the speaker has no evidence that the stronger element in the scale holds (i.e. it is not that case that *all* holds). Neo-Griceans believe that the implicature to deny the stronger term in the scale arises automatically as a "default" or "preferred " meaning. For example, the default interpretation of *some* is *some but not all*. This implicature can be cancelled, but only in certain contexts subsequent to the production of the scalar.[1]

The other account comes from Relevance Theory (Sperber & Wilson, 1985 1996), which assumes that an utterance can be inferentially enriched in order to better appreciate the speaker's intention, but this is not done on specific words as a first step to arrive at a default meaning. According to Relevance Theory, a scalar is but one example of pragmatic implicatures that arise when a speaker intends and expects a hearer to draw an interpretation of an utterance that is relevant enough. How far the hearer goes in processing an utterance's meaning is governed by principles concerning effect and effort; namely, listeners try to gain as many effects as possible for the least effort.

A non-enriched interpretation of a scalar term (the one that more closely coincides with the word's meaning) could very well lead to a satisfying interpretation of this term in an utterance. Consider *Some monkeys like bananas*. This utterance with an interpretation of *Some* that remains in its weaker form (this can be glossed as *Some and possibly all monkeys like bananas*) can suffice for the hearer and not require further pragmatic enrichment. In contrast, the potential to derive a scalar implicature comes into play when an addressee applies relevance more stringently. A scalar implicature could well be drawn by a hearer in an effort to make an utterance, for example, more informative. Common implicatures like scalars are implicatures that optionally play a role in such enrichment; they are not

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[1] Levinson does specify contexts in which the scalar implicature could be, in effect, preempted from occurring. One example (entailment) is when prior context blocks the scalar implicature because it would be inconsistent. Consider the following as prior context (from Levinson, 2000, p. 50) : *A Saudi Prince has just bought Harrod's;* this would block the production of a scalar implicature (*Some but not all*) in *Some Saudi princes must be pretty wealthy*. The existentially quantified statements that we will investigate here remain unembedded and thus should not preempt scalar implicatures according to Levinson.

steadfastly linked to the words that could prompt them. If a scalar does arrive in a context that renders an underinformative utterance more informative, it ought (all things being equal) to be linked with extra effort.

In this paper, we present two experiments to test between the neo-Gricean and the Relevance theory explanation of scalar implicature. Both of these experiments ask participants to judge the veracity of category sentences involving quantifiers. For example, a participant might see the sentence “All elephants are mammals” and would then have to judge whether the statement was true or false. The sentences of most interest are sentences of the form *Some X are Y*, where, in fact, all X are Y. An example of this type of sentence would be “Some monkeys are mammals”. This type of sentence will be considered false if the participant makes the implicature (so the sentences becomes ‘Some but not all monkeys are mammals’), but true if the participant makes the strictly logical interpretation of the term *some* (‘Some and possibly all monkeys are mammals’). We refer to “false” responses to this type of sentence as *pragmatic* and “true” responses as *logical*. We also present a variety of control sentences involving other quantifiers and other category relationships, such as “All birds are trout” (see Table 1). The sentences discussed earlier of the form *Some X are Y* will be referred to as Underinformative sentences to distinguish them from the Control sentences.

## Experiment 1

According to neo-Griceans, a Pragmatic response to Underinformative sentences should be quicker than a Logical response. This is because they consider the default interpretation of *some* to be *some but not all* and this is the first interpretation to be considered by the participant. Similarly, the Logical response should require a relatively long response time because the *some but not all* interpretation must be cancelled before the *some and possibly all* interpretation is made. In contrast, Relevance Theory predicts that processing effort is required to make the pragmatic enrichment of scalar terms such as *some*. This means that more time should be required to make the implicature *some but not all* and consequently to respond Pragmatically to the Underinformative sentences.

### *Method*

*Participants*. Thirty-two undergraduates from the Université de Lyon 2, who were either volunteers or presented with a small gift worth about 4 Euros, participated in this study.

*Stimuli and Design*. Participants saw six types of sentences. These are shown in Table 1, together with an example of each. Participants saw 9 examples of each type of sentence, making a total of 54 sentences. For each participant, the experimental sentences were generated randomly from a base of 6 categories and 9 exemplars from each of these categories (see Appendix). This randomization procedure was adopted to eliminate, or at least minimize, any unwanted effects of frequency or typicality on the reaction times.

Table 1
Examples of the Sentence Types used in Experiments 1-3

| Reference | Example sentence | Appropriate Response |
|---|---|---|
| T1 | Some elephants are mammals | ? |
| T2 | Some mammals are elephants | T |
| T3 | Some elephants are insects | F |
| T4 | All elephants are mammals | T |
| T5 | All mammals are elephants | F |
| T6 | All elephants are insects | F |

Note. T1 sentences are the underinformative sentences referred to in the text. The question mark in the Correct Response column indicates that T1 can be considered true or false depending on whether the participant draws the implicature or not.

*Procedure*. Participants were placed in front of a computer and told that they would see sentences presented on the screen. The only instructions participants were given was to respond ‘True’ if they thought the sentence on the screen was true, or ‘False’ if they believed the sentence to be false. Participants were not told whether their responses were correct or incorrect, i.e. there was no feedback.

### Results

*Data treatment.* Outliers were considered to be responses made in less than 0.5 seconds or more than 10 seconds. This resulted in 12 % trials being removed from the data set. Incorrect answers to the Control sentences were eliminated from the analysis involving reaction times. This resulted in an additional 10% of the responses being removed.

*Analysis of choice proportions.* The nine individual trials for each sentence type were pooled, producing a set of six means per participant. For the 5 control sentences, participants were largely in agreement in choosing true or false responses: Correct responses for T2 through T6 ranged from 87% to 98%.%. As demonstrated elsewhere (Noveck 2001), responses to Underinformative sentences prompt a high degree of bivocality - 61% of responses were pragmatic interpretations.

*Analysis of reaction times.* In order to assess whether a logical response was made more quickly than a pragmatic response, we divided each participant’s answers to Underinformative sentences into Logical and Pragmatic and then found the mean reaction time for these two groups. This gave us a within-participant measure of the change in reaction time for response type. However, 9 participants were excluded from the analysis because they responded to all trials using a single type of response – either all Logical (2) or all Pragmatic (7). Figure 1 shows the mean reaction

times for the six sentence types, with T1 divided into Logical and Pragmatic responses. Pragmatic responses for T1 sentences take longer than Logical responses. This trend was confirmed by performing a paired t-test between the average time taken to respond Pragmatically and the average time taken to respond Logically ($t_1(22)=2.07$, $p = 0.05$; $t_2(5) = 4.7$, $p = 0.0054$). Further analysis demonstrated that Pragmatic responses to T1 sentence required more time than to process than responses to any of the control sentences (all $p_1$'s $< 0.05$; all $p_2$'s $< 0.06$), while Logic responses to T1 sentences required the same amount of time as responses to the majority of control sentences (all $p_1$'s $> 0.13$; all $p_2$'s $> 0.25$).

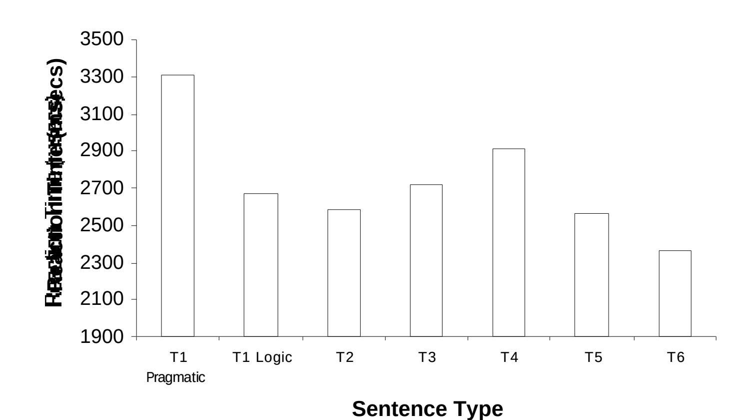



Figure 1.

*Discussion*

The main finding here is that mean reaction times were longer when participants responded pragmatically to the Underinformative sentences than when they responded logically. Furthermore, pragmatic responses to the Underinformative sentences were slower than responses to all of the control sentences. Collectively, our findings provide evidence against default implicatures because there is no indication that participants require more time to arrive at a true response for the Underinformative sentences. All indications point to the opposite being true: Logical responses to Underinformative sentences are indistinguishable from responses to control sentences while Pragmatic responses to Underinformative are significantly slower.

Although our experiments provide evidence against the idea that scalar implicatures become available as part of a default interpretation, they do not necessarily provide evidence in direct support of the alternative presented here, the Relevance theory explanation. (Moreover, a theorist in the original Gricean tradition could take the results from Experiments 1 as supportive to Grice's theory because the data point to a distinction between an initial semantic interpretation and a pragmatic one.) Our goal in the next experiment is to test directly predictions from Relevance theory concerning the processing of scalar implicature.

Experiment 2

According to Relevance theory, implicatures are neither automatic nor arrive by default. Rather, they are cognitive effects that are determined by the situation and, if they do manifest themselves, ought to appear costly compared to the very same sentences that do not prompt the implicature. In Relevance terminology, all other things being equal, the manifestation of an effect (i.e. the implicature) ought to vary as a function of the cognitive effort required. If an addressee (in this case, a participant) has many resources available, the effect ought to be more likely to occur. However, if cognitive resources are rendered limited, one ought to expect fewer implicatures. Experiment 2 tests this prediction directly by varying the cognitive resources made available to participants. The experiment follows the general procedure of Experiment 1, in that participants are asked to judge the veracity of categorical statements. The crucial manipulation is that the time available for the response is varied; in one condition participants have a relatively long time to respond (referred to as the Long condition), while in the other they have a short time to respond (the Short condition). By requiring participants to respond quickly in one condition, we intend to limit the cognitive resources they have at their disposal. Note that it is only the time to *respond* which is manipulated; participants are presented with the words one word at a time and at the same rate in both conditions, thus there is no possibility that participants in the Short condition spend less time reading the sentences than those in the Long condition.

Relevance Theory would predict fewer implicatures when participants' resources are limited. It is expected that they would be more likely to respond with a quick "True" response when they have less time than when they have more. If one wanted to make predictions based on default interpretations, *some* should be interpreted to mean *some but not all* more often in the short condition than in the long condition (or at least there should be no difference between the two conditions).

*Method*

*Participants*. Forty-five participants were used in the study. Participants were either volunteers or were presented with a small gift worth about 4 Euros.

*Stimuli and design.* Participants again had to respond true or false to 54 category statements, generated in the same way as in Experiment 1. The new independent variable was the time that participants were given to respond to the

statement, referred to as the Lag. The Lag was a between participant variable which could be either a short time (900 ms) after the presentation of the final word, or a long time (3000 ms). The dependent measure was the proportion of true responses within the time lag.

*Procedure.* The instructions for both conditions were similar to those of the previous experiment. In both Long and Short conditions, participants were instructed that if they took too long to respond they would see a message informing them of this. In the Short condition, speed of response was emphasized and participants were told that they would have to respond in less than half a second. The trial by trial procedure was similar to that of Experiment 1 until the participant made their response. After the response, the participant was told whether they were ‘in time’ or ‘too slow’. In the Short condition they were ‘in time’ if they responded in less than 900 ms, whereas in the Long condition the limit was 3000 ms.

*Results*

*Data treatment.* Responses that were outside the allotted time lag for each condition were removed from the analysis. Thus, responses were removed if they had an associated reaction time of more than 900 ms in the Short condition and more than 3000 ms in the long condition. This resulted in a total of 12 % eliminated from the Short condition and 0.7% from Long condition. There appeared to be a uniform distribution of removed responses across the different sentence types.

*Analysis*. Table 2 shows the rates of True responses for all six sentence types. The rate of correct performance among the control sentences either improves (T3 - T6) or remains constant (T2) with added response time. This trend is shown in the last column of Table 2 which, for control sentences, indicates the increase in proportion correct with added response time. In contrast, responses to the Underinformative sentences were less consistent with added time available. This change was such that there were more Logical responses in the Short condition than in the long condition: 72% True in the Short Lag condition and 56% True in the Long lag condition. This trend is in line with predictions made by Relevance theory. A t-test revealed that there were significantly more Logical responses in the Short Lag condition than in the long Lag condition ($t_1(43) = 2.43$, $p = 0.038$; $t_2(5) = 6.6$, $p< 0.005$), although no other sentence types showed a reliable effect after multiple comparisons had been taken into account.

Table 2
Summary of results for Experiment 2

| Sentence | Example | Short Lag | Long lag | Response difference |
|---|---|---|---|---|
| T1 | Some elephants are mammals | 0.72 (0.053) | 0.56 (0.095) | -0.16 |
| T2 | Some mammals are elephants | 0.79 (0.021) | 0.79 (0.038) | 0.00 |
| T3 | Some elephants are insects | 0.12 (0.012) | 0.09 (0.007) | +0.03 |
| T4 | All elephants are mammals | 0.75 (0.027) | 0.82 (0.024) | +0.07 |
| T5 | All mammals are elephants | 0.25 (0.061) | 0.16 (0.022) | +0.09 |
| T6 | All elephants are insects | 0.19 (0.017) | 0.12 (0.011) | +0.07 |

Note. The Short lag and Long lag columns contain the proportion of True responses for each condition. The final column refers to the increase in consistency of responses with added response time. For control sentences this equates to the increase in proportion correct with more time, while for the T1 sentences the figure is the Long condition True response minus the Short condition True response.

*Discussion*

This experiment manipulated the time available to participants as they were making a categorization judgements. We found that when a short period of time was available for participants to respond, they were more likely to respond “True” to T1 sentences. This strongly implies that they were less likely to derive the implicature when they were under time pressure than when they were relatively pressure-free.

The control sentences provide a context in which to appreciate the differences found among the T1 statements. They showed that performance in the Short Lag condition was quite good overall. In fact, the 72% who responded “True” in T1 represented the lowest rate of consistent responses in the Short condition. All of the control sentences in both the Short and Long lag conditions were answered correctly at rates that were above chance levels. For the control sentences, correct performance increased with added time.

The results of Experiment 2 provide further evidence against the neo-Gricean claim of default generation of the implicature. Furthermore, we feel that this experiment confirms a very specific prediction of Relevance Theory - that a reduction in the cognitive resources available will reduce the likelihood that an implicature will be made.

## General Discussion

The experiments presented in this paper were designed to compare the neo-Gricean and the Relevance Theory account of scalar implicature. Experiment 1 demonstrated that a pragmatic interpretation of a sentence involving a scalar implicature took longer than a logical interpretation. These results lend doubt to the neo-Gricean claim that the default treatment of *some* is *some but not all*. Experiment 2 presented a more direct test of the Relevance account. Cognitive resources were manipulated (by way of time available for responding) to see whether fewer resources were linked with fewer implicatures. In the Experiment, those who had less time to respond to Underinformative items (900 msecs), responded using a logical interpretation at rates that were above chance levels. Meanwhile, they also answered the control items correctly at rates that were even higher. As this account would predict, when resources were made

more available by way of increased time (3 seconds), it coincides with more implicature production and, thus, higher rates of pragmatic interpretations. Taken together, these findings indicate that people initially employ the weak, linguistically encoded meaning of *some* before employing stronger senses, arguably derived by a scalar implicature.

Until now, we have concentrated on theoretical linguistic-pragmatic accounts for the way scalar implicatures are drawn out of *some*. Here we consider a psychological possibility, which is that the error rates and slowdowns related to pragmatic readings of *some* results from the nature of the *some but not all* proposition itself. This explanation places the weight of the slowdown not on drawing the implicature *per se*, but on the work required to determine the veracity of a proposition with the implicature embedded within it. There are two ways in which the *some but not all* proposition is more complex than, say, *some but possibly all*. One is that such a proposition gives rise to a narrower set of true circumstances; thus determining whether or not a statement is true requires more careful assessments. The other is that negation, as is often the case, adds costs to processing (Just & Carpenter, 1971; Clark & Chase, 1972; although see Lea & Mulligan, 2002). Both of these suggestions are worthwhile descriptions of the cause of implicature-related slowdowns and worth further study. However, neither of these is inconsistent with Relevance theory's account, which makes the original counterintuitive prediction that the pragmatically enriched interpretation requires effort. Both of the above suggestions would have to have recourse to Relevance theory in order to explain its *a priori* predictions and results from Experiment 2, which showed how reduced resources lead to fewer implicatures.

In summary, this work largely validates distinctions made by Grice nearly a half-century ago by showing that what a term like *some* initially *says* is consistent with its logical reading. What it is understood to *mean* depends on the listener drawing further implicatures. This study focused on the manner in which implicatures are drawn. They do not appear to be general and automatic as neo-Griceans like Levinson claim. Rather, as outlined by Relevance Theory, implicatures occur in particular situations as an addressee makes an effort to render an utterance more informative.

References

Carston, R. (2002). *Thoughts and Utterances*. Oxford: Blackwell.

Chierchia, G., Crain, S., Guasti, M., Gualmini, A., & Meroni, L. (2001). The acquisition of disjunction: evidence for a grammatical view of scalar implicature. In A. H. J. Do (Ed.), *BUCLD Proceedings* (Vol. 25, pp. 157-168). Somerville, MA: Cascadilla Press.

Clark, H. H. (1973). The language-as-fixed-effect fallacy: A critique of language statistics in psychological research. *Journal of Verbal Learning and Verbal Behavior, 12*(4), 335-359.

Clark, H. H., & Chase, W. G. (1972). On the process of comparing sentences against pictures. *Cognitive Psychology, 3*, 472-517.

Evans, J. S. B., & Newstead, S. E. (1980). A study of disjunctive reasoning. *Psychological Research, 41*(4), 373-388.

Fillenbaum, S. (1974). Or: Some uses. *Journal of Experimental Psychology, 103*(5), 913-921.

Grice, H. P. (1989). *Studies in the way of words*. Cambridge, MA: Harvard University Press.

Horn, L. R. (1973). *Greek Grice: A brief survey of proto-conversational rules in the History of Logic*. Proceedings of the Proceedings of the Ninth Regional Meeting of the Chicago Linguistic Society. 205-214. Chicago

Just, M. A., & Carpenter, P. A. (1971). Comprehension of negation with quantification. *Journal of Verbal Learning and Verbal Behavior, 10*, 244-253.

Lea, R. B. (1995). On-line evidence for elaborative logical inferences in text. *Journal of Experimental Psychology: Learning, Memory, & Cognition, 21(6)*, 1469-1482.

Lea, R. B., & Mulligan, E. J. (2002). The effect of negation on deductive inferences. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 28*(2), 303-317.

Lea, R. B., O'Brien, D. P., Fisch, S. M., Noveck, I. A., & et al. (1990). Predicting propositional logic inferences in text comprehension. *Journal of Memory and Language, 29*(3), 361-387.

Levinson, S. (1983). *Pragmatics*. Cambridge: Cambridge University Press.

Levinson, S. (2000). *Presumptive meanings: The theory of generalized conversational implicature.* Cambridge, MA: MIT Press.

Moxey, L. M., Sanford, A. J., & Dawydiak, E. J. (2001). Denials as controllers of negative quantifier focus. *Journal of Memory and Language, 44*(3), 427-442.

Newstead, S. E. (1995). Gricean implicatures and syllogistic reasoning. *Journal of Memory & Language, 34(5)*, 644-664.

Noveck, I. A. (2001). When children are more logical than adults: Experimental investigations of scalar implicature. *Cognition, 78*(2), 165-188.

Noveck, I. A., Chierchia, G., Chevaux, F., Guelminger, R., & Sylvestre, E. (2002). Linguistic-pragmatic factors in interpreting disjunctions. *Thinking and Reasoning, 8*(4), 297-326.

Papafragou, A., & Musolino, J. (2003). Scalar implicatures: experiments at the semantics-pragmatics interface. *Cognition, 86*(3), 253-282.

Paris, S. G. (1973). Comprehension of language connectives and propositional logical relationships. *Journal of Experimental Child Psychology, 16(2)*, 278-291.

Paterson, K. B., Sanford, A. J., Moxey, L. M., & Dawydiak, E. (1998). Quantifier polarity and referential focus during reading. *Journal of Memory and Language, 39*(2), 290-306.

Pelli, D. G. (1997). The VideoToolbox software for visual psychophysics: Transforming numbers into movies. *Spatial Vision*(10), 437-442.

Rips, L. J. (1975). Quantification and semantic memory. *Cognitive Psychology, 7*(3), 307-340.
Sanford, A. J., Moxey, L. M., & Paterson, K. B. (1996). Attentional focusing with quantifiers in production and comprehension. *Memory and Cognition, 24*(2), 144-155.
Sperber, D., & Wilson, D. (1985 1996). *Relevance: Communication and Cognition.* Oxford: Basil Blackwell.

# Nominals are Doubly Dual

António Branco

## 1 Anaphora resolution

Since the so called integrative approach to anaphora resolution was set up in late eighties ([Carb88], [RL88], [AW89]) and its practical viability extensively checked up ([LL94], [Mit98], among others), it is common wisdom that factors determining the antecedents of anaphors divide into filters and preferences. The latter help to pick the most likely candidate, that will be proposed as the antecedent; the first exclude impossible antecedents and help to circumscribe the set of antecedent candidates

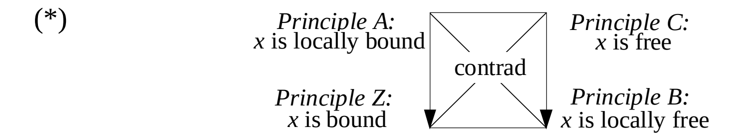
Binding constraints are a significant subset of such filters. They capture empirical generalizations concerning the relative positioning of anaphors with respect to their antecedents in the grammatical geometry of sentences. We follow here the definition proposed in [PS94] for these constraints, and subsequent extension in [XPS94], [BM99]:

> **Principle A:** A locally o-commanded short-distance reflexive must be locally o-bound.
> *Lee$_i$ thinks [Max$_j$ saw himself$_{*i/j}$].*
> **Principle Z:** An o-commanded long-distance reflexive must be o-bound.
> *Zhangsan$_i$ cong Lisi$_j$ chu tingshuo [Wangwu$_k$ bu xihuan ziji$_{i/*j/k}$].* [10]:ex(2)
> Zhangsan$_i$ heard from Lisi$_j$ [Wangwu$_k$ doesn't like "himself"$_{i/*j/k}$].
> **Principle B:** A pronoun must be locally o-free.
> *Lee$_i$ thinks [Max$_j$ saw him$_{i/*j}$].*
> **Principle C:** A non-pronoun must be o-free.
> *[Kim$_i$'s friend]$_j$ thinks [Lee saw Kim$_{i/*j}$].*

X *o-binds* Y iff X o-commands Y and X is the antecedent of Y. *O-commands* is a partial order under which, in a clause, the Subject o-commands the Direct Object, the Direct Object o-commands the Indirect Object, and so on, following the obliqueness hierarchy of grammatical functions; in multiclausal sentences, the upward arguments o-command the embedded arguments, etc. The *local domain* is, roughly, the subcategorization domain of the predicator selecting the anaphor.

When stripped away from procedural phrasing and non-exemption requirements, these generalizations, quite surprisingly, instantiate the following square of oppositions (detailed discussion in [BM99]):

(*)

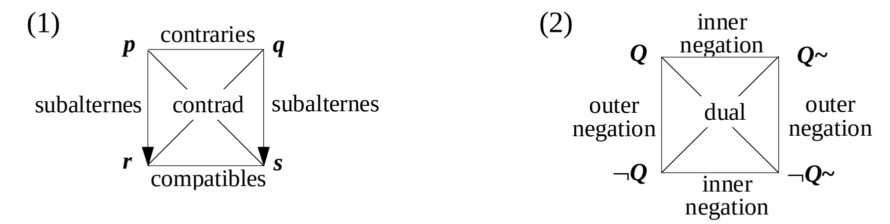



Given this square, the questions to pursue and the answers we argue for in this presentation are: (A) *Question*: Is this a sign that binding constraints are the effect of some underlying quantificational structure? *Answer*: Yes. (B) *Question*: What are the implications for our

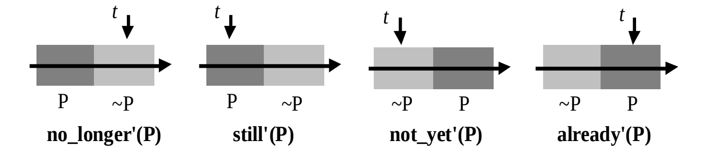
understanding of the semantics of nominals, and in particular of their dual nature as referential and quantificational expressions? *Answer*: Nominals are doubly dual, in a sense to made made precise in this presentation.

## 2 Phase quantification

Löbner suggested that the emergence of a square of logical duality between the semantic values of natural language expressions is a major empirical touchstone to ascertain their quantificational nature [Löb87]; and van Benthem, while noting that the ubiquity of the square of duality may be the sign of a semantic invariant possibly rooted in some cognitive universal, highlighted its heuristic value for research on quantification inasmuch as "it suggests a systematic point of view from which to search for comparative facts" [vanBent91](p.23).
Given the issues raised by (*), it is of note that the square of duality in (2) is different from the classical square of oppositions in (1): The difference lies in the fact that *duality*, *inner negation* and *outer negation* are third order concepts, while *compatibility*, *contrariness* and *implication* are second order concepts.

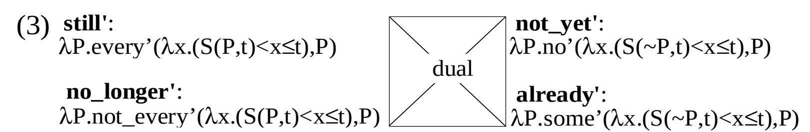



There are instantiations of the square of oppositions without corresponding squares of duality, and vice-versa ([Löb87],p.56 for discussion). Although the two squares are logically independent, the empirical emergence of a square of oppositions, such as the one in (*), naturally raises the question about the possible existence of an associated square of duality. We will argue that the answer to this question is affirmative and that it provides also an answer to question (A) above.
Before this result may be worked out, some analytical tools are to be introduced first. We will resort to the notion of phase quantification, which was introduced in [Löb87] to study the semantics of aspectual adverbials and was shown there to be extended to characterize quantification in general. For the sake of concreteness, consider a diagrammatic display of the semantics of these adverbials:




Very briefly, phase quantification requires the following ingredients: (i) a partial order over the domain of quantification; (ii) a property *P* defining a positive phase in a sequence of two opposite phases; (iii) a parameter point *t*; and (iv) the starting point of the relevant semiphase given the presupposition about the linear order between *P* and ~*P* phases.

For aspectual adverbials, (i) the order is the time axis; (ii) *P* denotes the instants where the proposition containing the adverbial holds; (iii) *t* is the reference time of the utterance; (iv) the starting point *s(R,t)* is the infimum of the set of the closest predecessors of *t* which form an uninterrupted sequence in *R* — the adverbials *no longer* and *still* bear the presupposition that phase *P* precedes phase *~P* (*~P.P* for the other two adverbials). These adverbials express the following quantifiers:

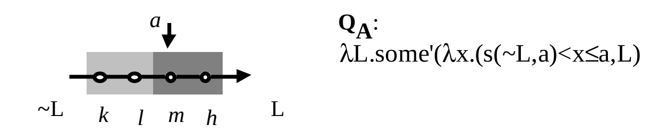



## 3 Binding constraints

Turning to the quantificational structure of binding constraints, given the space constraints of this abstract, we take Principle A as a working example.

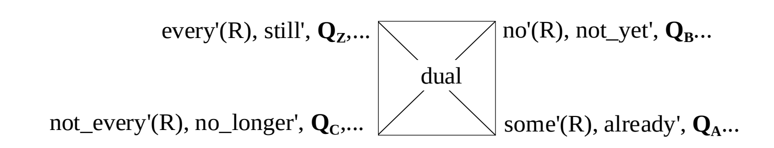
Phase quantification here is assumed to unfold over entities in grammatical representations, vz. reference markers *a la* DRT, and its ingredients are as follows: (i) Reference markers are ordered according to the o-command relation; (ii) *P* is here *L*, the set of markers in the local domain of the anaphor; (iii) *t* is instantiated as *a*, the marker of the antecedent for the anaphor.

The quantifier expressed by short-distance reflexives, ruled by Principle A, can be associated with the presupposition that *~L.L*. It receives the following definition, which is easily interpreted against the diagram corresponding to the example sentence, *Kim said Lee thinks Max$_i$ hit himself$_i$*, where *k*, *l*, *m* and *h* are the markers of *Kim*, *Lee*, *Max* and *himself*.




*$Q_A(L)$* is satisfied iff between the bottom of the uninterrupted sequence *~L* most close to the antecedent *a* and *a* inclusive, there is at least one reference marker in *L*. As *~L* precedes *L*, this amounts to requiring that *a* be in *L*, the local domain of *h*, and consequently that *a* be a local o-commander of *h*, which matches precisely the requirement in Principle A.

In the presentation, we argue at length that this quantifier is one of the corners of a square of duality which includes quantifiers for the other three classes of anaphors. Such quantifiers result from those in (3) above simply by replacing *t* by *a*, and apply to *L* instead of *P*.




Just another very brief example. The phase quantifier of pronouns lies at the same corner as the quantifiers *no'* or *not_yet'*: *$Q_B(L)$* is satisfied when no reference marker between the beginning of *~L* and the antecedent *a* inclusive is in *L*, which implies that *a* has to be in *~L*, i.e. it has to be outside the local domain of the pronoun, as required in Principle B.

These results may shed new light over a number of interesting issues. For instance, given their parameterized validity across natural languages, the universal character of binding principles has been seen as a striking feature: When envisaged as a set (the so-called "binding theory"), they appear as one of the best candidates to be a module of universal grammar. Given the universality of quantification in natural language, if binding constraints are the visible effect of quantifiers, it is not surprising then they are universally operative across natural languages.

Besides, not all languages have anaphors of each of the four binding types. In English, there is no long-distance reflexives. This is in line with the well known fact that not every corner of a duality square may be "lexicalized", as Löbner puts it: In some squares, there may not exist a single expression for a given corner, which is then expressed by some other means (e.g. a complex expression, such as *not every* — [Löb87],p.65 for a fully-fledged discussion).

## 5 The duality reference vs. quantification

Many authors have underlined that there is no correspondence between surface and logical form of quantificational expressions of natural languages. Löbner emphasized this non-correspondence by pointed out that, while domain restrictor and quantified predicate are rendered by two different surface expressions in nominal quantification, in phase quantification expressed by aspectual adverbials, only the quantified predicate is available at the surface form.

With phase quantification expressed by anaphors, this gulf between surface and logical form widened further: There is no surface expression directly rendering either the domain restrictor of quantification or the quantified predicate.

More important, quantification is extended to universes whose elements are not entities of the "extra-grammatical" universe, but entities of the "intra-grammatical" world itself: The models against which binding phase quantification is to be interpreted are not representations of the world, with everyday entities like donkeys, farmers, etc., but grammatical representations, with entities like reference markers, grammatical functions, etc. Hence, satisfaction of a formula made out of a binding phase quantifier, $Q_{\boldsymbol{A}}$, $Q_{\boldsymbol{Z}}$, $Q_{\boldsymbol{B}}$ and $Q_{\boldsymbol{C}}$, turns out to be a well-formedness constraint on the sentence where the corresponding anaphor occurs: For the meaning of "classic" quantification to be determined, one has to know how the world has to be for it to be true; for the meaning of binding phase quantification to be determined, one has to know how the corresponding grammatical representation has to be for it to be true.

Finally, it is worth considering the implications of the results above for the overall semantic make up of nominals. The shared wisdom is that nominals convey either quantificational or referential force — a large bulk of the research on the semantics of nominals has been concerned with determining which side of this divide definite descriptions belongs to ([Neale93], [LS95] a.o.). For the sake of the argument, let us accept that definites are referential terms. Let us also take into account that proper names are ruled by binding Principle C.

Given these assumptions, the analysis presented above imply that nominals with "primary" referential force (*he*, *the book*, *John*,...) have a certain "secondary" quantificational force: They express quantificational requirements — over reference markers in grammatical representations

—, but cannot be used to directly quantify over extra-linguistic world entities, like the other "primarily" quantificational nominals do (*every man*, *most students*,...).

This duality of semantic behavior, however, turns out not to be that much surprising if one observes a symmetric duality with regards to quantificational nominals, apparent when they act as antecedents in e-type anaphora, as in the example *Most students$_i$ came to the party and they$_i$ had a wonderful time*. The analysis of e-type anaphora envisaged by some authors (e.g. [KR93]:4.1.2) implies that nominals with "primary" quantificational force have a certain "secondary" referential force: These nominals have enough referential strength to evoke and introduce reference markers in the grammatical representation that can be picked as antecedents by anaphors — and thus support the referential force of the latter —, but they cannot be used to directly refer to extra-linguistic entities, like the other "primarily" referential terms do.

If the results reported here are meaningful, the duality quantificational vs. referential nominals is less strict but more articulated than it has been assumed. Possibly taking indefinite descriptions aside, every nominal makes a contribution in both semantic dimensions of quantification and reference, but with respect to different universes. "Primarily" referential nominals have a dual semantic nature — they are "primarily" referential and "secondarily" quantificational — that is symmetric of the semantic nature of "primarily" quantificational ones — they are "primarily" quantificational and "secondarily" referential.

Besides the fact that when expressing quantificational force, many nominals are logical duals of other nominals, when it comes to the duality reference vs. quantification, nominals seem to have a doubly dual semantic nature, where reference and quantification are much more intertwined than what had been figured out.

## References


[AW88] Asher and Wada. 1988. A Computational Account of Syntactic, Semantic and Discourse Principles for Anaphora Resolution. *Journal of Semantics*, 6, pp.309-344.

[vanBen91] van Benthem, 1991. Linguistic Universals in Semantics. In Zäfferrer, ed. 1991. *Semantic Universals and Universal Semantics*, Foris, Berlin, pp.17-36.

[BM99] Branco and Marrafa, 1999, Long-Distance Reflexives and the Binding Square of Opposition, in Webelhuth, Koenig and Kathol, eds., *Lexical and Constructional Aspects of Linguistic Explanation*. CSLI, Stanford, Ch. 11.

[CB88] Carbonell and Brown. 1988. Anaphora Resolution: A Multi-strategy Approach, In *Proceedings of COLING88*, pp.96-101.

[KR93] Kamp and Reyle, 1993. *From Discourse to Logic*. Kluwer, Dordrecht.

[LL94] Lappin and Leass. 1994. An Algorithm for Pronominal Anaphora Resolution, *Computational Linguistics*, 20, pp.535-561.

[LS95] Larson and Segal, 1995. *Knowledge of Meaning*. The MIT Press, Cambridge.

[Lön87] Löbner, 1987, Quantification as a Major Module of NL Semantics, in Groenendijk, de Jongh and Stokhof, eds., *Studies in DRT and the Theory of Generalized Quantifiers*. Foris.

[Mit97] Mitkov. 1997. Factors in Anaphora Resolution: They are not the only Things that Matter. A Case-study based on two Different Approaches. In *Proceedings of the ACL/EACL97 Workshop on Operational Factors in Practical, Robust Anaphora Resolution.* ACL.

[Neale93] Neale, 1993, Term Limits, *Philosophical Perspectives*, 7, 89-123.

[PS94] Pollard, and Sag. 1994. *Head-driven Phrase Structure Grammar.* CSLI, Stanford.

[XPS94] Xue, Pollard and Sag, 1994, A New Perspective on Chinese *Ziji*. *Proceeedings of the West Coast Conference on Formal Linguistics*, 13. CSLI, Stanford.

[RL88] Rich and LuperFoy. 1988. An Architecture for Anaphora Resolution, In *Proceedings, 2nd Conference on Applied Natural Language Processing*, pp.18-24.

## On pragmatic intrusion into semantic content

The main empirical aim of this paper is to establish a distinction among types of 'implicatures' - between those that can enter into semantic content and those which would normally not enter into content. The distinction is motivated by a somewhat novel account of communication which uses elements of situation theory and relevance theory.

At the heart of Grice's pragmatic theory is a technical notion of 'saying'. Non-conventionally determined components of the content of an utterance are determined as following from the speaker saying what she says in a context where the CP and maxims are presupposed. For Grice's theory to coherently function as he proposed it, 'what is said' ought to be equivalently definable as what is conventionally meant (minus conventional implicatures) or as the logical, semantic content of the utterance. However, as many have observed, the logical, semantic content of an utterance often seems to involve non-conventional components. (1)a non-conventionally implies that the ostracisation took place after, and as a result of, the inebriation. But the implications of temporal order and causality seem to have become part of the semantic interpretation of the nuclear scope of the adverbial quantifiers in (1)b (hence the lack of contradictoriness):

(1) a. At the party, I got drunk and no one talked to me.
    b. It's not true that, at parties, I always get drunk and no one talks to me; it's that no one talks to me and I get drunk.

As has long been noted (by Wilson, Kamp, Kempson i.a.) this 'pragmatic intrusion' has serious consequences not just for pragmatic theories but also for semantic theories - for what are we to say about the semantic rules which determine the interpretation of sentences containing operators and connectives which seemingly allow non-conventional content within their scope? Among the many responses to this issue are the extremes of denial that there is intrusion (Stanley 2000, King & Stanley 2003) and denial that intrusion is a problem (Kamp, Sperber & Wilson). The latter school tend to view conventional, linguistic meaning as yielding only underspecified representations which are 'developed' in certain ways to yield something which would give us the semantic content. More conservatively, SDRT (see Asher 1999) posits a circumscribed 'primary' pragmatic phase which defeasibly determines a semantic content which may be subject to revision in the secondary phase, where the global context involving the speaker's intentions is considered. Carston (2002) proposes just one global phase of pragmatic processing involving a 'satisficing' of what is explicit and implicit. According to Carston, any kind of implicature could, in principle, intrude into content. I have elsewhere argued that both of these positions are problematic for various reasons.

Briefly, it seems clear that much semantic content incorporates elements derived by considering speaker's intentions - in particular, specific indefinites (see Stalnaker 1998, Kamp & Bende-Farkas 2001). Also, it is unclear that a coherence-based SDRT could account for all pragmatic intrusions - such as in referential uses of definites, metonyms and more creative cases.

While I agree with Carston that all aspects of interpretation are computed as a matter of determining speakers' intentions, I have argued that there is nothing in her proposal to say what should or should not go into the semantic content of an utterance.

Both Asher & Carston have basically pragmatic inferential accounts of implicit/explicit. By contrast Chierchia's (2001) grammatical account of intrusion builds on the neo-Gricean notion of 'defaultness' for GCIs positing the local inclusion of GCIs into the linguistic semantic computation. This is problematic if one attempts to extend it beyond the scalar cases Chierchia considers since the so-called 'I-implicatures' (as in (1) above) do not have exclusive triggers (conjunction and juxtaposition do not always have these implications). More seriously, so it will be argued below, genuine scalar implicatures never really intrude into content.

It will be proposed that intuitions about what is, or can be, part of semantic content derive from how

the acts are perceived. In particular, it will be proposed that our intuitions distinguish between what a speaker directly indicates and what she indicates indirectly. The former notion is the source of intuitions about the semantic content of an utterance. Here we will give a brief sketch of the main ideas before making some suggestions about what may not intrude into content.

The proposal draws on the two basic ideas of S&W's relevance theory. One is that, at it's most basic, a communicative act is perceived as a matter of one agent drawing another agent's attention to something. The other idea is that communicator and addressee co-ordinate on what the attention is being drawn to by assuming that the natural response to an act of ostension is to seek out a source of relevance in the direction indicated. We assume that the objects of attention are situations. In situation theory, communicative language use is a matter of providing a characterisation of the type of the situation being indicated. The proposal is that, conventionally, the use of language in a communicative act is part of the ostensive gesture. The gesture provides more or less help in narrowing down what is being indicated. Thus what is indicated by an utterance is constrained, but not fully determined, by the type of situation determined compositionally from the sentence meaning. So, in a sense, the meaning of a sentential node will always underdetermine the content of the sentence's interpretation - rather like the semantic rule for 'we' only says that the collection referred to includes the speaker.

It is interesting to consider the fact that, when people perform ostensive acts, they often simultaneously display how they relate to what they indicate. Saying, "My pet bird has died", the speaker may also draw the audience's attention to how she feels about this. She may also say, "My pet bird, sadly, has died". Parentheticals do not contribute to semantic content, but guide the audience toward was is being indirectly indicated. Indirectly indicated situations involve the speaker and the situation directly indicated and they carry information about how the speaker relates to an indicated situation. Of the many ways in which speakers relate to what they indicate directly, speaker's reasons and grounds are often of interest. Grice's (1975) discusses "He is an Englishman. He is, therefore, brave." as a matter of two ground-floor speech acts (saying that he is English and that he is brave) and an indirect indication that the grounds for the second speech act involve some constraint linking being English and brave. We argue that all genuine 'implicatures' be modelled on these lines. The example of my uttering 'I have a cold' to a suggestion of a swimming expedition is a case in point. A situation directly indicated will carry much information for the audience, depending on what constraints they are attuned to. Which of this information they exploit depends on their own interests. However, on some occasions, it will become necessary that the audience be aware of certain constraints linking the type of the situation indicated with other situation types since these constraints may figure prominently in what is indirectly indicated. In the case at hand, I am directly indicating a situation in which I have a cold and indirectly indicating that this fact serves as a reason for my turning down the offer. In this case, the act of indicating this latter situation (involving the directly indicated situation and the speaker) constitutes something like an indirect speech act of excusing oneself. To recognise this act, one has to make the inference about how the directly indicated situation would serve as a reason for refusal. Our intuitions that the information that I cannot go swimming because I have a cold is not contained in the semantic content of the utterance stem from the fact that this information is contained in what is indirectly communicated only and is not carried by what is directly indicated.

Following Stalnaker (1998), we can say that the semantic content of the utterance of the first sentence in "A man walked. He whistled." is merely existential; but the speaker indirectly indicates something of her grounds for the utterance, involving the individual she has in mind. Thus, while the speaker's referent is not in the situation directly indicated, he is in what is indicated overall and hence available for future anaphoric reference. We argue that where information would stem from speakers' grounds, then it never intrudes into direct content for reasons of redundancy - this is why the speaker's referent does not figure in proposition expressed by the utterance of the first sentence.

At least some scalar implicatures arise as a matter of the speaker indirectly indicating that their

epistemic relation to what is directly indicated involves a situation of a type which is contained in the type of the directly indicated situation. For example, if a speaker directly indicates a situation of a type where some students pass, then her grounds may involve a situation of a type where some passed and some failed. We advocate an analysis of'some/not all' implicatures as a case where the speaker, in uttering "Some (of the) Fs G-ed", chooses not to use a more economical and potentially more informative form, "the Fs G-ed". This calls for a reason, the usual one being that she is drawing one's attention to more specific grounds. We will focus in our presentation on the 'some/not all' case as a genuine case of implicature/indirectness. There is good reason to agree with Verkuyl & van der Does (1995) and Carston (1998) that numerals may underspecify in their meaning as to whether they mean 'at least n' or 'exactly n' (see Papafragou & Musolino 2003 for developmental evidence which points in this direction) - hence numerals may not give rise to genuine scalar implicatures. Other prototypical scalars may go the same way.

Levinson (2000) suggests that, with stress, some/not all SIs intrude into the scope of conditionals:

(2) If you eat SOME of that cake you won't get fat.

It is suggested that this is understood to mean, 'if you eat some but not all of the cake you won't get fat'. One can account for this intuition without assuming that the antecedent of the conditional has itself been strengthened by a scalar implicature.

Following Rooth, we can assign a structure to (6) as in (3)a giving rise to a contextual set of alternatives of the form in (3)b:

(3) a. [[If you eat $[\text{SOME}]_F$ of that cake you won't get fat]~C]
b. [if you eat D of that cake you won't get fat]

One possible context is that which contains one alternative, 'any'. The difference between 'any' and 'some' in DE contexts is that, since 'some' is a kind of indeterminate quantity expression, this makes the 'any' alternative actually logically stronger than the 'some' alternative. One obvious reason why the speaker did not use the stronger alternative would be that she thinks that if you eat the whole cake you will get fat. And this of course would be presupposed to be part of the context. Given this presupposition, the meaning of the sentence uttered would yield a conflicting conclusion where all of the cake is eaten. Given our intuitions about the utterance, it seems we assume that the conditional with the more specific antecedent would be taken to hold in these circumstances. This is to be expected given that there is a general principle of reasoning which says that if two conditional generalisations yield conflicting conclusions in certain circumstances, then the conditional with the more specific antecedent should be favoured. So, given that the speaker's intonation would draw our attention to this presupposition, it is clear he meant the stated conditional holds only in circumstances where not all of the cake is eaten.

This seems a more satisfactory account to that which just supposes that the conditional sentence in (2) is taken to mean 'if you eat some but not all of the cake you won't get fat'. On this understanding, the speaker is communicating nothing informative about cases where we eat all of cake. But this doesn't seem quite right. It seems it is part of the overall interpretation of such an utterance that if some Fs G then P but if all Fs G then not P. That is, we only get the 'implicature intrusion' effect where we are made aware of both conditionals. Note also that it is much more difficult to understand (4) as implying you will get fat if you eat both. This is so since there is no ready stronger alternative to 'or' in the DE context.

(4) If you eat the cake OR the cookies, you won't get fat

Levinson also suggests that SIs of the 'some/not all' variety can intrude into the scope of negation:

(5) It's not true that some men are chauvinists. All men are.

We argue that this is possible because there is a so-called echo negation in addition to sentential

negation (see Cormack & Smith 1998). Consider the contrast in intrusive possibilities where negation is genuinely sentential (in the scope of modals). Temporal & causal inferences get in, SIs don't:

(6) a. John shouldn't wash his hair and go out in the cold.
b. ? John shouldn't make some of the beds before his break. He should make them all.
c. John shouldn't mark exams and get paid extra; marking is part of his job description.

(7) a. Mary mustn't have slept with Brad Pitt and fallen pregnant, otherwise it would be all over the tabloids.
b. ? Mary mustn't have passed some of the students, otherwise she would have drafted a re-sit exam.

We also note that true echo negation can include parentheticals in its scope:

(8) a. It's not true that John's dog, sadly, died. It was a vicious cur and the neighbourhood couldn't be happier about its death.
b. It's not true that John's dog, it's sad to say, has died. It was a vicious cur and the neighbourhood couldn't be happier about its death.

Examples like (9) (from Sauerland 2001) have been much discussed as cases where scalar, some/not all implicatures are available within the scope of disjunction.

(9) John had some of the peas or the broccoli last night.

Chierchia (2001) and others point to this as evidence of SI intrusion into content and hence support for a grammar which computes SIs locally. Sauerland proposes a more conservative account whereby the understanding, 'some but not all Fs G or P' is derived because it is implied globally that not all Fs G. While Sauerland seems right that the appearance of intrusion results from a global implication, his account, involving a more elaborate default mechanism for computing scalar implicatures has some problems. It will be argued, rather, the implication is derived from what the speaker indirectly indicates about her grounds in making the disjunctive utterance.

One good reason to think that our understanding of (9) is due to a global implication that not all Fs G rather than a locally computed SI comes from considering that (10)b below is incoherent in the context given. If the SI is computed locally, there seems to be no reason why (10)b should not be as coherent as (10)a. On the global account, the incoherence is predictable since the assumption that not all students passed is inconsistent with the other disjunct:

(10) *Context: If a student fails the exam, he/she gets a chance at a re-sit early in the summer vacation. The re-sit is set and administered by the teacher of the course.*
a. Mary is either on vacation or some of her students failed.
b. # Mary is either on vacation or some of her students passed.

Sauerland proposes a global account of (9) which involves some dubious default implicature mechanisms. One involves having A and B as scalar alternatives to $A \vee B$ in addition to $A \wedge B$ - implying that B and $\neg B$ are implicatures of any assertion A. Another more general component of Sauerland's account assumes that SIs for a sentence containing two scalar triggers are selected from a set of alternatives which is a kind of cross product of the individual scalar alternatives. More precisely, if $\phi(X,Y)$ is a sentence containing scalar terms X and Y where X is a term on scale $Q_X$ and Y on $Q_Y$, the set of scalar alternatives is $\{\phi(X',Y')$: X' is an element of $Q_X$ and Y' is an element of $Q_Y\}$. The predicted implicatures are then the denial of all $\phi(X',Y')\}$ that entail $\phi(X,Y)$ (modulo default inferences about the epistemic state of the speaker). But this seems to wildly over-generate unattested implicatures. For instance, according to this (11)a implicates (11)b, (12)a implicates (12)b. But these never seem to be implicated.

(11) a. Some people who attended some of the talks were bored
b. No one who attended all of the talks was bored

(12) a. Some people whose coffee was warm complained
b. No one whose coffee was hot complained

It can be argued that the implicature is suggested as a matter of the speaker indicating something of their grounds for the disjunctive utterance, that not all Fs G. It is interesting that hearing (9) out of the blue, without any knowledge of the contents of the relevant fridge, although we sense the suggestion of this inference, we are in the dark as to whether John didn't eat all the peas because he couldn't have (there were too many) or the speaker has more direct evidence to the contrary (she has seen that some of the peas are left). In cases where it is clear in the context that the speaker could not know whether or not all Fs G, the implicature evaporates (assuming it is consistent that he could have eaten all, if he was hungry):

(13) John: We've left our guest at home alone all evening. Was there anything there for him to eat?
Mary. There were only last night's left-overs in the fridge. So he has either eaten some of those or ordered take-out.

Again we can have an account of this by reasoning from the use of the less economical description which cannot be as informative as the bare definite alternative to something about the speaker's grounds. Where a speaker uses disjunction to characterise two or more exclusive epistemic alternatives, we would conclude that she is indirectly indicating that her grounds for making the whole disjunctive utterance include the information that not all Fs G-ed. There is a good reason why this kind of implication is 'global' rather than 'local' in situations where the disjunction gives rise to the clausal and scalar implicature. On the one hand, since grounds are 'certain', one would never indirectly indicate anything about one's grounds within the characterisation of one of the epistemic alternatives. On the other, in raising the issue of whether all Fs G-ed by use of the marked form and therefore making the question relevant, the speaker would have to specify the 'just some or all' alternatives as separate disjuncts, if she did not have information which would resolve the issue. Therefore, one can conclude the marked form was used because the speaker as a means of indirectly indicating she has information that not all Fs G-ed.

Other examples offered by Chierchia involve intrusion into epistemic contexts:

(14) Bill thinks that some of the students passed.

As Chierchia admits, the intuition that this implies 'Bill thinks some but not all passed' is not so strong. In order to elicit the judgement, he suggests imagining a context where the speaker of (14) has just spoken to Bill who has said, "Some students passed". Just so. In that case the speaker's grounds will make reference to Bill indirectly indicating his own grounds. In as far as one can assume the use of the marked form suggests the speaker of (14) is indirectly indicating this, then the implicature will be available. Although matters have to be considered on a case by case basis, we believe that all apparent intrusions of genuine SIs can be handled in this way.

**References**: **Asher** (1999) 'Discourse structure and the logic of conversation', in Turner (ed) *The Sem./Prag. Interface from Different Points of View* CRiSPI. **Carston** (1998) 'Informativeness, relevance and scalar implicature', in Carston etc (eds.) *RT: Applications and Implications.* John Benjamins. **Carston** (2002) *Thoughts and utterances*, Blackwells. **Chierchia** (2001) 'Scalar implicatures, polarity and the syn./prag. interface', ms UniMiB. **Cormack & Smith** (1998) 'Negation, polarity & V positions in English' *UCLWPiL 10.* **Kamp & B-F** (2001) 'Indefinites & binding'. ESSLI notes. **King & S.** (2003) 'Semantics, pragmatics & the role of semantic content. ms UMich. **Levinson** (2000) *Presumptive Meanings*, MIT Press. **Papafragou & M.** (2003) 'Scalar Implicatures: experiments at the sem.-prag. interface'. *Cognition*. **Sauerland** (2001) 'Defense of a global account of implicatures', ms Tubingen. **Stalnaker** (1998) 'On the representation of context', *JoLLI.* Stanley (2000) 'Context and logical form', *LI.* **Verkuyl & vdD** (1995) 'The semantics of plural noun phrases' In J. van der D. ed *Quantifiers Logic and Language.*

# Semantic Underspecification and the Pragmatic Interpretation of *Be*

The copula verb *be* can appear in range of constructions apparently involving complements of different sorts and a wide variety of interpretations. For example, in English we find *be* inducing an interpretation of identity with a noun phrase complement in equatives (1); as doing little more than hosting tense and agreement information with adjective, prepositional and nominal phrases in predicatives (2); giving rise to existential interpretation in construction with *there* (3); as some sort of presentational marker with an expletive subject (1d); as part of a construction determining focus in cleft (5), and pseudo-cleft (6) constructions.

(1) John is the teacher.

(2) Kim is happy.

(3) There is a riot on Princes Street.

(4) It's me.

(5) It is John who is the teacher.

(6) What I want is a good night's sleep.

The variability in the interpretation of *be* in (1-6) has led to a considerable debate within the literature on theoretical syntax and semantics. The issues turn on whether the copula is ambiguous, in particular between equative and predicative constructions and, if not, what the semantic contribution of the verb is.

In recent years, unitary accounts of *be* have tended to find favour. So, for example, Partee (1986) treats the copula as 'essentially' predicative with a single semantic type $(e \rightarrow t) \rightarrow (e \rightarrow t)$ with the semantic structure $\lambda P \lambda x.P(x)$[1]. Such an analysis, of course, treats the copula as essentially semantically vacuous beyond providing different ways of combining with an argument and a predicate and requires other means of deriving equative readings (such as Partee's type-raising function **Ident** which maps a term, $a$, onto an identity predicate $\lambda x.x = a$).

The distinction between equative and predicative uses of *be* is further compounded by the subtle differences in meaning apparently exhibited by very similar sentences. For example, copular clauses involving a definite noun phrase give rise to slightly different interpretations according to the order in which the noun phrases appear and are often divided into two classes: equative clauses, as in (7) where the post-copular definite appears to be fully referential, and specificational clauses, as in (8) where the initial definite appears to provide a description of an unknown entity, rather than to pick out some specific object.

[1]Partee, in fact, allows a variable type and analysis with the arguments of the expression appearing in either order, i.e. $\lambda x \lambda P.P(x) : e \rightarrow ((e \rightarrow t) \rightarrow t)$.

(7) John is the culprit.

(8) The culprit is John.

This subtle variation in interpretation, taken with the fact that the distinction between equative and predicative interpretations depend on the properties of the postcopular expression being a term or a predicate naturally leads to a view of copular sentences in which interpretation is dependent on the properties of the expressions with which *be* is combined and the *way* that they are combined. This view in turn raises the question of what part pragmatics plays in the interpretation of such sentences.

In this paper, I explore an approach to the interpretation of *be* in English that treats it as semantically vacuous, but as inducing pragmatic 'enrichment' to determine the content of the clause. By means of treating the copula as projecting a semantically underspecified predicate, I show how the interpretation of copular clauses is determined by the properties of collocated expressions, non-local context and the parsing process itself.

The framework to be used is that of *Dynamic Syntax* (Kempson et al. 2001) according to which the process of natural language understanding is a monotonic tree growth process defined over the left-right sequence of words, with the goal of establishing some propositional formula as interpretation. Intrinsic to this process are concepts of underspecification which provide goals to be achieved in constructing an appropriate interpretation given some string of words in context. Thus, driven by the universal requirement to construct a representation of propositional content, $?Ty(t)$, the words of a string are parsed in strictly time-linear fashion to derive progressively more specified tree structures, representing content. Such content may be provided by the semantics of the individual lexical items, but may also be derived from the interaction of pragmatic processes with the parsing process itself. It is on this sort of interaction that the analysis in this paper is built.

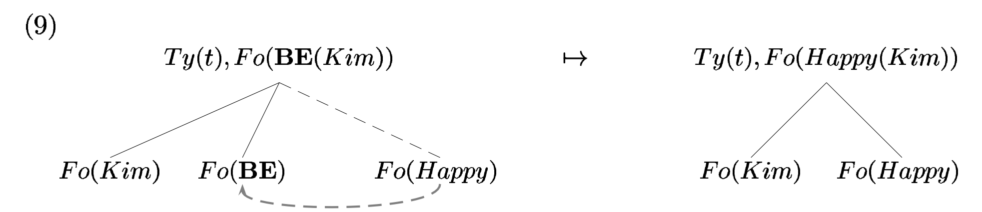
In Dynamic Syntax, certain expressions project formula values that act as placeholders for contentful values to be found in context. Thus, pronouns project METAVARIABLES with an associated requirement to find a contentful substitute for this placeholder during the course of a parse. For example, in a sentence *John upset her* in the context induced by *Who upset Mary?*, the pronoun is analysed as projecting a metavariable, $Fo(\mathbf{U})$ ($Fo$ being the formula label) which in the context given is (and must be) substituted by the content of the proper name *Mary*, to yield the propositional content $Fo(Upset(Mary)(John))$. The substitution process is system external and constrained only through item specific conditions (such as analogues of the Binding Principles) and pragmatic conditions, construed here in terms of Relevance Theory (Sperber and Wilson 1995). A similar account is given of definites within this framework, where the definite article is treated as a pronominal form that projects a metavariable while the content provided by the common noun phrase provides a further 'presuppositional' constraint on substitution.

Metavariable projecting expressions need not be restricted to terms, however, and, developing ideas put forward in Cann et al. 2002 for expletive con-

structions, I argue that copular *be* projects a *predicate* metavariable ($Fo(\mathbf{BE})$). Depending on the nature of the collocated expressions the required content may be determined directly by the syntax (as in predicative constructions) or through pragmatic reasoning (as in specificational and equative constructions), yielding different interpretational effects.

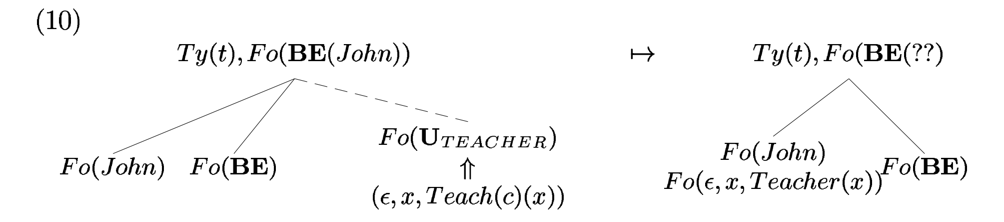
In the proposed analysis, the subject plus copular provide an underspecified proposition while postcopular expressions are analysed as 'unfixed' with respect to this propositional structure, having to MERGE with the either the subject or the predicate node, depending on type. With predicate constructions, as in (2), the first two words are taken to project a structure which compiles to yield the propositional formula $Fo(\mathbf{BE}(Kim))$. The postcopular predicate expression provides the value of the predicate expression through a Merge process to yield a complete formula value $Happy(Kim)$.

(9)




Equative and specificational clauses are analysed similarly, except that the postcopular term, being of type $e$, merges, not with the predicate node, but with the subject. In the case of equative clauses, such as (1), the content of the subject is established directly through the semantics of the proper noun *John*. The postcopular definite, however, has underspecified content represented by a metavariable with associated presupposition (e.g. $\mathbf{U}_{TEACHER}$). This metavariable induces SUBSTITUTION of some appropriate term in context whose value must have the property expressed by the presupposition. for example, in a context in which it has been established that the speaker is taking a course, an term epsilon term may be constructed that picks out the arbitrary witness for whoever teaches that course, i.e. $Fo(\epsilon, x, Teach(c)(x))$. This *substituted* term then Merges with the subject node to yield a complex node who distinct formula as shown schematically in (10).

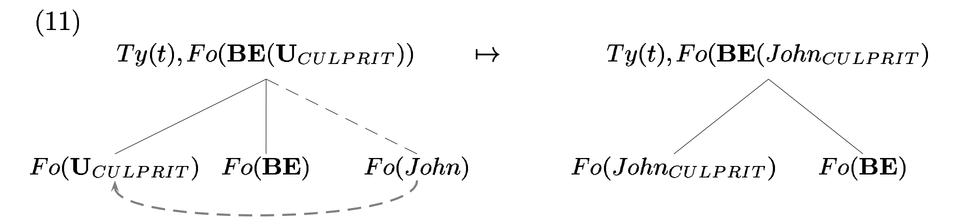
(10)



The apparently contradictory formula values on the subject node are resolved as a single complex epsilon expression interpreted as picking out a single witness satisfying the semantic properties of both subject and postcopular NP, thus effectively equating their denotata. In an analysis of (1), therefore, the parse gives rise to an underspecified propositional formula $\mathbf{BE}(\epsilon, x, John(x) \wedge Teach(c)(x))$ which still requires specification of the predicate to be interpretable. The value for the predicate metavariable must then be determined inferentially from context to provide some proposition meaningful to the hearer. For example, where the focus of the conversation is what John is doing with himself these days, the most relevant substituend may be $\lambda x.Teacher(x)$. This will yield an interpretation of *John is the teacher* ($Teacher(\epsilon, x, John(x) \wedge Teach(c)(x))$) that entails *John is a teacher* ($Teacher(John)$). However, alternative contexts may yield different inferential effects where the implication that John is a teacher comes, not directly from the semantic representation, but from the 'presupposition' associated with the postcopular definite.

Specificational sentences are analysed analogously, but in this case the value of the metavariable projected by the initial definite is not established by substitution, but receives its content directly through the Merge process. In other words, the subject and predicate combine to project a doubly underspecified proposition, about which the only thing that is known is that the subject must have the property expressed by the subject's common noun phrase. The output of parsing the first three words in (8) thus give rise to the formula value $\mathbf{BE}(\mathbf{U}_{CULPRIT}$. To provide the content of the subject, the postcopular term is analysed again as unfixed and as merging directly into the subject position, as shown in (11).

(11)




The resulting propositional formula, $\mathbf{BE}(John_{CULPRIT})$, is still incomplete, but the value for the predicate metavariable is provided by the presupposition of the definite expression, which has not been used to identify some other term from context and so is an appropriate substituend because informative to the hearer. The resulting proposition expressed by (8) is thus $Culprit(John)$. The difference between the interpretation of the specificational clause in (2) and the truth conditionally equivalent *John is a culprit* is argued to reside in the *process* by which the final propositional content is established. In other words, the process of postulating initially underspecified information that there is some entity who is a culprit who has some property and then establishing the identity of that entity and the appropriate property has different informational effects from merely identifying the entity from some name and then having the relevant predicate stated directly.

The conclusion of the paper is thus that by modelling the process by which an interpretation is established and using semantic underspecification which requires to be satisfied through syntactic, semantic or pragmatic processes, one can provide a uniform characterisation of the copula in a range constructions. Such an analysis necessarily entails that it is the properties of the expressions collocated with the copular and the context in which a copular clause is uttered have an effect on interpretation.

**References**

Cann, R, R Kempson, and M Otsuka (2002) 'On Left and Right Dislocation: A Dynamic Perspective'. MS U. of Edinburgh/King's College London.

Geist, L (2002) 'Predication and equation: two BEs or not two BEs?' Paper *Existence: Syntax and Semantics*, U. de Nancy 2.

Heycock, C and A Kroch (1999) 'Pseudocleft connectedness: implications for the LF interface level'. *Linguistic inquiry* 30:365-397

Kempson, R, W Meyer-Viol and D Gabbay (2001) *Dynamic Syntax.* Oxford, Basil Blackwell.

Partee, B H (1986) Ambiguous pseudoclefts with unambiguous be. *NELS* 16: 354-366.

Sperber, D and D Wilson (1995) *Relevance: Communication and Cognition.* Oxford, Basil Blackwell.

# How to Deny a Presupposition

**Summary**

This paper deals with the puzzle of sentences like (i.a), which denies (i.b).

(i) a. The King of France is not bald, because there is no King of France.

b. The King of France is bald.

In previous analyses of such examples two problems are often overlooked: the first is that (i.a) is supposed to express denial of (i.b) specifically on the grounds that the existence of a King of France is its presupposition, but it is not clear how, if at all, (i.a) does so; the second is that (i.a) is quite marked, whereas there are other, much more natural ways to deny (i.b), e.g. (ii).

(ii) The King of France can't be bald, because there is no King of France.

I propose that the puzzle can be accounted for if negation is taken to be the standard descriptive negation. I argue that, in this case, (ii) demonstrates that the existence of a French King is a presupposition of (i.b), and rejects (i.b) on these grounds. Sentence (i.a) is entailed by (ii), hence it is also a possible way to deny (i.b); however, its marked nature comes from the fact that it is not as informative as (ii), thus violating Grice's Quantity maxim.

## 1 Introduction

Suppose someone says to you:

(1) The king of France is bald.

Obviously, there is something wrong with (1): it presupposes (2), which is false.

(2) There is a King of France.

You wish to correct the speaker who uttered (1). What will you do? Common wisdom has it that one of the plausible things you could say is:

(3) The King of France isn't bald, because there is no King of France.

In this paper I explain how (3) succeeds in its goal. Note that while it does deny (2), the presupposition of (1), it does not deny the presupposition *relation* between (1) and (2): it does not deny that (1) presupposes (2). On the contrary, it is precisely because there is such a presupposition relation that (1)

is rejected. But by what mechanism is this fact expressed? I will call this the problem of *presupposition-based denial*: (3) expresses denial of (1) because of its false presupposition.

To see further the significance of this problem, consider (4).

(4) The President of France isn't bald, because he uses Rogaine on a daily basis.

Sentences (3) and (4) have the same structure, but are understood very differently: (4) gives a reason why the President of France manages to avoid hair loss, whereas (3) gives a reason why (1) is denied. The two sentences also differ in their acceptability: while (4) is perfectly good, (3) is rather marked; so marked, in fact, that early work on presupposition (Frege, Strawson) completely ignores such sentences. Exactly what, then, is the difference between the two? And what is its source?

# 2 Previous approaches

It is possible to identify four main approaches in the literature to sentences like (3).

1. Negation is semantically ambiguous. There is the standard type of negation, which does not deny presuppositions, and another type that does.

2. Negation is ambiguous, but pragmatically, rather than semantically (Horn 1989). We have, in addition to the standard (descriptive) negation, a *metalinguistic* type of negation that negates utterances, rather than sentences, and it is this negation that denies presuppositions.

3. The word *because* is lexically ambiguous (Burton-Roberts 1989; in addition, he proposes that negation is pragmatically ambiguous, as in 2 above). *Because* can be used to indicate real causality between two propositions, as in (4), but it can also indicate the reason why the speaker is licensed to utter a certain sentence, as in (3).

4. There is no ambiguity, either semantic or pragmatic (Geurts 1998). The difference between (3) and (4) lies in nothing more than the projection of the existential presupposition: in (4) it projects, but in (3) it does not, because projecting it would result in inconsistency.

Each of the approaches has a number of empirical and theoretical problems, which I cannot go into in this abstract. But a crucial problem, common to all of them, is that they do not provide any account of how (3) expresses the fact that (1) presupposes something (which is false). But this is precisely the reason why (1) is rejected.

# 3 Tests for Presupposition

Suppose we wanted to demonstrate to our friend, who uttered (1), that the sentence has a false presupposition. How would we do this? Well, there are standard tests for presupposition we can use.

One such test is negation; we can demonstrate that (2) follows from both (1) and its negation. Crucially, we are talking about descriptive negation here: the test would fail otherwise. So, we could say something like

(5) "The King of France is bald" entails "There is a King of France," and "The King of France is not bald" entails "There is a King of France."

From (5) it follows that

(6) "The King of France is bald or the King of France is not bald" entails "There is a King of France."

Applying contraposition (with descriptive negation), we get:

(7) "There is no King of France" entails "The King of France is neither bald nor not bald."

To conclude our argument that (1) ought to be rejected, we must conjoin (7) with the proposition that there is no King of France:

(8) There is no King of France, and "There is no King of France" entails "The King of France is neither bald nor not bald."

Sentence (8) is a mouthful, and it might be too technical to be understood by our ignorant friend. We can make it easier to utter and understand by expressing "$p$, and $p$ entails $q$" as "$q$ because $p$." Of course, saying that $q$ is the cause of $p$ is saying more than simply that $q$ is a sufficient condition for $p$, but this simplification will do for our purposes here. We can thus turn (8) into (9).

(9) The King of France is neither bald nor not bald, because there is no King of France.

Note that (9) is a very natural response to (1); much better, in fact, than (3). Moreover, exactly this type of presupposition-based denial is attested in the works of no other than Strawson, who is usually thought to have ignored any possibility of presupposition denial:

(10) He neither cares nor doesn't care; he's dead (Strawson 1952:18).

Caring presupposes being alive; if the person under discussion is dead, the presupposition is false, a point made clearly by (10).

Another standard presupposition test is the "possibly" test: if $Y$ follows from "Possibly $X$", then $X$ presupposes $Y$. So, we could point out to our friend that

(11) If the King of France is possibly bald, then there is a King of France.

Again, applying contraposition (with descriptive negation), we get:

(12) If there is no King of France, the King of France can't be bald.

We add the fact that there is no French King, and get:

(13) There is no king of France, and if there is no King of France, the King of France can't be bald.

Again, we can make (13) easier to utter and understand:

(14) The King of France can't be bald, because there is no King of France.

Once more, this sentence is a very natural responses to (1), much more so than (3).

In fact, such sentences can be found in literary texts. It is not often the case that authors make their characters presuppose false information, but in the rare cases where they do, the response they get is often similar to (14). Here is a quote from *Alice in Wonderland*:

(15) 'Take some more tea,' the March Hare said to Alice, very earnestly. 'I've had nothing yet,' Alice replied in an offended tone, 'so I can't take more.'

And here is one from Shakespeare's *The Taming of the Shrew* (Act V, scene I):

(16) **Vincentio:** Come hither, you rogue. What, have you forgot me?

**Biondello:** Forgot you! no, sir: I could not forget you, for I never saw you before in all my life.

This, then, is the way to perform a presupposition-based denial: demonstrate, using some standard test for presupposition, that a certain statement is presupposed by the speaker, and point out that this statement is false. Descriptive negation, and the usual meaning of *because* (or similar devices), are quite sufficient for the task.

## 4 Denial and Informativeness

This is not, however, quite what (3) does. We have explained how sentences like (9) and (14) deny (1) on the grounds of its false presupposition. But what about (3)? How does *this* sentence succeed in denying (1)? And why is it not as good as (9) or (14)?

To answer this question, note that (9) entails (3), because if the King of France is neither bald nor not bald, he is not bald. Sentence (14), too, entails (3): if the King of France can't be bald, he is not bald.

Therefore, if either (9) or (14) is true, so is (3). But (3) can also be true in circumstances where (9) or (14) are not. Specifically, (3) says that the existence of a French King follows from (1), but does not require it to follow by way of presupposition; it may be an entailment. Indeed, if (4) is true, this would be because baldness entails, rather than presupposes, failure to use Rogaine regularly. Hence, (3) is not sufficiently informative—it violates Grice's (1975) Quantity maxim. In general, an utterance that violates a maxim can be judged odd, or misleading, but would not normally be so bad as to be unassertable; it may be assertable, though marked. This is why (3) is true and assertable, but it is marked, and worse than (9) or (14).

To conclude, what *is* the difference between (3) and (4)? Both use the usual descriptive negation (and the usual *because*). The difference is in their informational content. In sentence (4), the cause is directly related to the effect. Not so in (3), where, instead of the full effect of the cause, we only have something that is entailed by the effect. For this reason, (3) has a different *feel* from (4), as if the causal relation is different, when in fact it is exactly the same in both.

## References

BURTON-ROBERTS, N. 1989. *The Limits to Debate: A Revised Theory of Semantic Presupposition*. Cambridge: Cambridge University Press.

GEURTS, B. 1998. The mechanisms of denial. *Language* 74.274–307.

GRICE, H. P. 1975. Logic and conversation. In *Syntax and Semantics 3: Speech Acts*, ed. by P. Cole and J. L. Morgan. Academic Press.

HORN, L. 1989. *A Natural History of Negation*. Chicago: University of Chicago Press.

STRAWSON, P. F. 1952. *Introduction to Logical Theory*. London: Methuen.

# Metonymy at the semantics-pragmatics interface

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In a metonymic utterance, an expression does not refer to its usual referent but to another referent that is in some way associated with the first one. This part of the utterance meaning (its *metonymic component*) is not verbalised, but must be recovered from extralinguistic conceptual knowledge. E.g., the metonymic component of (1) is the use of *The Three Tenors* to refer to their recordings. Metonymic utterances need not exhibit semantic mismatches in their literal reading, as illustrated by (1): Its literal reading is semantically well-formed but conflicts with conceptual knowledge about shelves and tenors. However, there is a semantic mismatch for the literal reading of many metonymic utterances, e.g., in (2), where the labelling affects the containers of the wine:

(1) The Three Tenors are on the top shelf

(2) The wine was labelled

In this paper, I argue that metonymy is situated right at the semantics-pragmatics interface (SPI). I will expound three arguments in favour of such an analysis. First, it offers an initial *motivation* for metonymy. Second, it yields new insights into the *interaction* of literal meaning and metonymy in the determination of the full meaning of a metonymic utterance. Finally, there are properties of metonymy that can only be explained in pragmatic terms, e.g., the use of *preferences* to choose among different interpretation options for a metonymic utterance, and the influence of metonymy on the *accessibility* of discourse referents.

At a first glance, metonymy seems unmotivated: Hearers must put up with utterances that call for a non-literal interpretation, while for speakers the production of metonymic utterances is complicated in that they must partition the information they want to get across into a part that is to be verbalised and another one that is not.

These apparent problems can be put down to the *conversational maxims* (Grice 1975), the eventual motivation for metonymy. Hearers accept metonymic utterances because they believe that speakers follow the conversational maxims, in particular, the *cooperative principle*. I.e., they regard all utterances of the speaker as adequate. If utterances do not make sense literally, this is seen as a signal for metonymy. For speakers, metonymy optimises the trade-off between *contrary* conversational maxims of manner, which require an utterance to be succinct and clear at the same time: Metonymy allows succinct utterances, as their meanings are verbalised only in part. But conceptual knowledge immediately supplies the non-verbalised part, viz., the metonymic component. Thus, these utterances are clear in spite of their brevity.

This account overcomes problems for purely semantic analyses of metonymy, in particular, for the *Generative Lexicon* theory (Pustejovsky 1995), where only semantic mismatches trigger metonymy. The metonymic component is located in extended semantic entries, which introduce (in so-called ‘qualia’) additional information, e.g., on the origin or purpose of referents. But such analyses fail for metonymic utterances that fall outside the range of the ‘qualia’ (like (1) and (2)) or, like (1), show no semantic mismatch in their literal meaning.

The second argument for the SPI perspective on metonymy is that it clarifies the interaction of literal meaning and metonymy in the determination of utterance meanings. Semantic reasoning cannot tell which constituent undergoes metonymy, e.g., whether the subject or the predicate is affected in cases like (1) and (2). Pragmatic reasoning helps here: NPs of the kind *the X* presuppose that in the given context there is only one individual in the extension of *X*. If in a metonymic sentence this uniqueness presupposition still holds for the literal meaning of such an NP, the NP cannot have undergone metonymy. This diagnostic reveals that metonymy may affect different constituents. For (3), the uniqueness presupposition holds for sandwich eaters, but not for sandwiches: There may be several sandwiches, but only one sandwich eater. I.e., metonymy affects the subject, it means ‘the ham sandwich eater’:

(3) The ham sandwich wants his check

In contrast, the uniqueness presupposition still holds for the wine in the metonymic (2): There is a unique wine quantity, but there may be several wine containers. Thus, the subject cannot have undergone

metonymy here, hence, it is (perhaps surprisingly) the predicate of (2) that was affected by metonymy. Its meaning emerges as 'have a container that is labelled'.

The examples suggest that the metonymic content is eventually based on a common-sense ontology. But metonymy rarely leads to several equally favoured interpretation options, as *preferences* select the contextually most plausible reading from a set of ontologically equally plausible readings. E.g., the shift from a substance to an object that it constitutes is ontologically as plausible as the shift from the substance to its container. Yet the first interpretation option is not available in (2). This contrasts with the analogous (4); here, the interpretation option that the labelling affects objects consisting of gold (e.g., ingots) is the preferred one:

(4) The gold was labelled

The pragmatic impact of metonymy also surfaces in the fact that it may affect the *accessibility* of discourse referents. This shows up for the subject metonymy in (3), but not in the predicate metonymy in (2). The former metonymy makes available a discourse referent for the non-literal meaning of the subject and blocks the accessibility of the discourse referent for the literal meaning of the subject. Therefore, (3) can be continued by *He is in a hurry* but not by *It was very tasty*.

This contrasts with the anaphoric potential of (2), which is not affected by metonymy. I.e., metonymy does not introduce an accessible discourse referent for the wine container, neither does it make the referent of the wine inaccessible. This is illustrated by the fact that *It had a long, spicy, slightly confected finish* but not *They were mouth-blown* is a possible continuation of (2).

This interdependence of metonymy and accessibility of discourse referents is related to cases like (5), which are discussed in Grosz et al. (1995): One of their NPs (here, the subject) has two different interpretations. It may refer to the unique bearer of a specific property (whoever that might be) or to a specific individual (who happens to be identifiable as the unique bearer of this property). Nunberg (1993) calls these uses 'attributive' and 'referential'. Depending on the interpretation, these NPs introduce different discourse individuals. E.g., only the attributive interpretation of *the Vice-President of the United States* provides an accessible discourse referent for the anaphor in a continuation like *Historically, he negotiates between President and Congress*:

(5) The Vice-President of the United States is also President of the Senate

Grosz et al. (1995) note that cases like (5) require a semantic representation formalism that can express partial interpretations of utterances. This holds good for metonymy, too, which suggests modelling metonymy in *underspecification formalisms* like UDRT (Reyle 1993), Minimal Recursion Semantics (Copestake et al. 1997), or Constraint Language for Lambda Structures (Egg et al. 2001). Semantic construction describes the meaning of metonymic utterance only in part. The further pragmatic processing of these utterances then emerges as (monotonic) integration of conceptual knowledge with partial semantic knowledge to obtain full utterance meanings.

# References


Copestake, A., D. Flickinger, and I. Sag (1997). Minimal Recursion Semantics. An introduction. Available from `ftp://ftp-csli.stanford.edu/linguistics/sag/mrs.ps`.

Egg, M., A. Koller, and J. Niehren (2001). The constraint language for lambda-structures. *Journal of Logic, Language, and Information 10*, 457–485.

Grice, P. (1975). Logic and conversation. In P. Cole and J. Morgan (eds), *Syntax and semantics 3: Speech acts*, 41–58. New York: Academic Press.

Grosz, B., A. Joshi, and S. Weinstein (1995). Centering: a framework for modeling the local coherence of discourse. *Computational Linguistics 21*, 203–225.

Nunberg, G. (1993). Indexicality and deixis. *Linguistics & Philosophy 16*, 1–43.

Pustejovsky, J. (1995). *The Generative Lexicon*. Cambridge: MIT Press.

Reyle, U. (1993). Dealing with ambiguities by underspecification: construction, representation, and deduction. *Journal of Semantics 10*, 123–179.

# Definiteness and English Prenominal Possessives

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Much of the recent work on English possessives has taken the prenominal possessive construction ("X's Y") to be inherently definite.[1] But there are widespread counterexamples:

(1) We're going out tonight because **Jane's old friend** is in town.
(2) **Oscar's finger** got bitten off by a parrot.
(3) **Your car's headlight** is out.

*Prima facie*, the felicitous use of each of these NPs requires neither the uniqueness nor the discourse-familiarity of its referent. In particular, we experience no sense of contradiction or incompatibility between the prenominal possessive construction and our background beliefs that people have multiple great-grandfathers, fingers, and old friends, and cars more than one headlight. Supporting this intuition, each can be replaced by a postnominal possessive with indefinite article (e.g. **an old friend of Jane's**) with little change in meaning, while none can be felicitously replaced by a postnominal possessive with definite article.

Several semanticists have recognized the invalidity of attributing definiteness to prenominal possessives across the board, and have attempted to generalize the (potentially) non-definite nominals in terms of various structural and lexical phenomena. I believe that these accounts frequently mistake contextual (pragmatic) influences in their data for evidence about the prenominal possessive construction itself. Against this view, I argue that a satisfactory account of the referential properties of prenominal possessives will appeal to highly specific aspects of the way particular possessors, possessees, and their relationships are represented conceptually. I regard this as yet another aspect of the generally acknowledged semantic flexibility of the possessive relation.

There are several different ways in which definiteness is understood. I adopt what I take to be a fairly typical pragmatic conception: a nominal is definite iff its felicity is associated with its profiling one and only one maximally salient referent. I hold no strong belief as to whether familiarity can on some level be reduced to uniqueness (e.g. Abbott, 1999) or uniqueness to familiarity, but they are at least deeply intertwined. I essentially agree with von Heusinger's (1995) position that "[t]he general function of the definiteness [sic] lies neither in uniqueness nor in anaphorical linkage or functional use but rather in the very property of referring to a salient object."

The linguistic phenomena described as uniqueness and familiarity both seem to reflect general cognitive abilities: just as we can search for a missing object by its

[1] For example, Partee and Borschev (1998) give "John's team" the formal analysis $\iota z[team(z) \,\&\, R_i(John)(z)]$, where $\iota$ is "a definite description operator which applies to an open sentence to produce a term which denotes the unique entity which satisfies the open sentence, if there is one and only one such entity, and otherwise fails to denote anything."

prominent features (e.g. looking for red things) or by restricting our search domain (e.g. to our bedroom), so we can cause a nominal to profile a unique referent by adding descriptive content or by working within a domain established by discourse or extralinguistic context. The two mechanisms, of course, are not either-or, but regularly work together in rather complicated ways. In example (4), a fairly sophisticated definite description is built upon a domain (things in Boston) made salient by the preceding discourse. In (5), an incomplete description is filled out by extralinguistic context (the man's appearance) such that the listener is ideally able to distinguish between the many actors from that movie.

(4) We were in Boston at one a.m., and we were really hungry, but **the only decent restaurant open that late** was on the other side of town.
(5) A: Who's that guy over there? B: Oh, you know, he's **the actor from *Saving Private Ryan***.

Working from the above understanding of definiteness, I argue that an English prenominal possessive is not inherently definite or indefinite, and that recent attempts to explain the relationship between this construction and the nominal's referential status, fail to do justice to the diversity of the data. First, I respond to a proposal by Barker (2000) that attempts to explain some problematic referential properties of possessives without abandoning the position that they are definite. Second, I discuss a structurally defined class of prenominal possessives where the claim to mandatory definiteness has seemed very strong (those with overt number like "John's four dogs"), and present data collected from the World Wide Web to show that they can indeed be non-definite in appropriate context.

Barker (2000) points out that the referent of a prenominal possessive need not be familiar from the discourse or the extralinguistic context. In fact, a listener might have no prior reason to suspect its existence. Example (6), as he notes, is perfectly felicitous:

(6) A man walked in. **His daughter** was with him.

Since "his daughter" does not profile a maximally salient referent, I take (6) to be evidence against the view that prenominal possessives are inherently definite. Barker, preserving the definiteness assumption, accounts for this example by significantly modifying the notion of familiarity. According to his novel account, familiarity is a property held by tokens of a linguistic expression, not by discourse referents. Thus, crucially, an expression can count as familiar even if its referent is not salient. This, he argues, is often the case for a prenominal possessive, since it acquires its familiarity from the possessor nominal.

Naturally, the need for such an account is done away with if we regard nominals like "his daughter" in (6) as non-definite. Barker considers the possibility, but gives two reasons for (tentatively) ruling it out. First, he claims that the phrase "has uniqueness presuppositions, one of the hallmarks of definite descriptions." I argue, first, that this position is intuitively incorrect on any ordinary conception of presupposition, and second, that it would be incompatible with the motivation of Barker's analysis. If "his daughter" in (6) did uniquely refer, if it was a full-fledged Russellian definite description, then it

would not constitute a special problem for being a prenominal possessive.  Rather, it would be an instance of the broader fact that definite descriptions are capable of introducing novel referents:

(7) A man came in.  **The tallest player in the WNBA** was with him.

Barker's second argument for the definiteness of certain prenominal possessives (those whose possessors are definite) is that they fail the syntactic "existential *there*" test:

(8a) There is a man's daughter in the garden.
(8b) * There is his daughter in the garden.

In response, I raise some doubts about the traditional analysis of "existential *there*" as a simple test for indefiniteness, such as its incompatibility with certain indefinite relationals:

(9a) A cousin came to my house. [=a cousin of mine]
(9b) * There was a cousin outside my house. [=a cousin of mine]

Storto (2000), following Zamparelli (1995), argues that prenominal possessives with an overt number "always trigger maximality entailments", based upon examples like (10a).  Since maximality, in this sense, is just uniqueness for a nonatomic nominal, this would mean that all such phrases are definite.  If this hypothesis were correct, then we would at least have a well-defined structural environment in which the referential properties of the prenominal possessive construction are essentially uniform.

(10a) #These [pointing left] are my four dogs, and those [pointing right] are my four dogs too.

A deeper consideration of English, however, reveals that even a prenominal possessive with overt number can introduce a novel referent without entailing uniqueness (maximality), given appropriate context.  In (10b), I find no presupposition or entailment that the speaker has only those four dogs, belying the maximality explanation for the infelicity of (10a).  Certainly it is required that a group of the appropriate size be identifiable; if the speaker were pointing in the general direction of ten dogs, and there were insufficient clues from discourse or context to make a group of four maximally salient, then the assertion would be highly infelicitous.  But this correct requirement should not be confused with the incorrect requirement of maximality, which would mean that the speaker could have no other dogs anywhere in the world.

(10b) These [pointing to a group of four dogs] are my four dogs.

Turning to my own data, Google searches for "his two fingers" and "his two friends" revealed numerous examples, from widely different modes and registers, of non-definite use.  I base these judgments on the apparent novelty the referents, together with

the complete lack of suggestion that the person in question has only two fingers or friends.

(11) "…then we realized he was having a seizure and that we had to keep him down and keep his tongue from choking him," said Rivera. … Rowe held down Rodriguez while Rivera suppressed his tongue with **his two fingers** wrapped in a T-shirt.[2]

(12) He hesitantly drew his had close to her face, watching her eyes intently, fearing that by some fluke, she might suddenly turn her head and glare at him, wondering what he was doing. She didn't. He touched her cheek gently and led **his two fingers** down its slope to her chin.[3]

(13) Paddy and **his two friends** are talking at a bar. His first friend says: "I think my wife is having an affair with the electrician…"[4]

(14) A nurse rushed to the Al Wayli police station and accused her boyfriend and **his two friends** of raping her in his apartment.[5]

Certainly we should expect some dialectal and even idiolectal variation amongst English speakers' acceptance of certain possessives; where feasible, examination of appropriate corpora should greatly aid our analysis of this construction. Since English associates several different constructions with roughly the same set of "possessive" meanings, we run the particular risk of confusing *the best* form, the one we would use in writing or more measured verbal discourse, with the only form that the language or dialect renders grammatical. Some of the search results for non-definite "his two fingers" and "his two friends" I would regard as marginal, yet they appear to have been produced by native speakers. Regardless, there are quite a few examples, like (11)-(14), which I and most of my acquaintances find completely natural. As expected, just like in examples (1)-(4), the possessives in (11)-(14) can be replaced by the indefinite postnominal possessive "two friends of his" but not by the definite postnominal possessive "the two friends of his."[6] The cases where overt number in possessives leads to maximality entailment are clearly not universal, and, moreover, they seem to be in just the same sorts of context where overt number would tend to imply or entail maximality in nominals that are not possessives. At present, I see no good reason to treat such possessives any differently than other nominals involving number, where uniqueness effects are generally dependent upon pragmatic information about the things described and the purpose of their mention.

[2] http://www.yuma.usmc.mil/pao/readarticle.asp?article=52
[3] http://kirkis-elf.com/w_hpotter/first_kisses02.html
[4] http://www.gore-high.school.nz/sudentwork/09/Hillart/Jokes.htm [sic]
[5] http://www.metimes.com/issue39/commu/streets.htm
[6] "Two fingers of his" is rather awkward; it seems that certain body part terms in certain contexts require the prenominal possessive construction, being incompatible with the postnominal possessive and also with the definite article, even when the referent would seem to be appropriately salient. I intend to investigate this phenomenon in the near future.

a. John went to the vet to buy heartworm pills for **the dog**.
b. *John went to a dermatologist to have a wart removed from **the back**.

Abbott, Barbara (1999). Support for a unique theory of definite descriptions. In Tanya Matthews and Devon Strolovitch, eds., *Proceedings from Semantics and Linguistic Theory IX*. Ithaca: Cornell University. Pp 1-15. http://www.msu.edu/user/abbottb/support.htm

Barker, Chris (2000). Definite possessives and discourse novelty. *Theoretical Linguistics* 26:211-227.

Heim, Irene (1982). *The Semantics of Definite and Indefinite Noun Phrases*. Ph.D. diss., University of Massachusetts, Amherst.

Partee, Barbara H. and Vladimir Borschev (1998). Integrating lexical and formal semantics: Genitives, relational nouns, and type-shifting. In: Robin Cooper and Thomas Gamkrelidze, eds., *Proceedings of the Second Tbilisi Symposium on Language, Logic, and Computation*. Tbilisi: Center on Language, Logic, Speech, Tbilisi State University. Pp 229-241.

Storto, Gianluca (2000). On the structure of indefinite possessives. In: Brendan Jackson and Tanya Matthews, eds., *Proceedings of Semantics and Linguistics Theory X*. Ithaca, NY: CLC Publications, Cornell University.

Zamparelli, Roberto (1995). *Layers in the Determiner Phrase*. Ph.D. diss., University of Rochester. http://www.cogsci.ed.ac.uk/~roberto/layers/intro.html

**Tolerating exceptions with „descriptive“ and „in virtue of“ generics: two types of modality and reduced vagueness**

**Yael Greenberg**

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**Problem and Goal:** Generics with indefinite singular subjects (IS sentences, like *A dog has four legs*), and those with bare plural subjects, under their descriptive reading (descriptive BP sentence, like *Tall carpenters drink only water on Tuesdays*) tolerate exceptional and irrelevant entities (individuals and situations) in the same basic way, but differ w.r.t. the degree to which the properties which legitimize the exceptional entities can be specified in advance. The full range of similarities and differences between the two types of generics in this respect cannot be accounted for by any exceptions-tolerance mechanism that has been suggested in the literature. This paper develops an improved exceptions- tolerance mechanism for dealing with the full range of facts, which integrates insights from Greenberg’s 2002 work on the different modalities of IS and descriptive BP generics, and from Kadmon & Landman’s 1993 characterization of the generic operator as a domain vague quantifier.

**Background assumptions**: Although minimally contrasting IS and BP sentences in English (e.g. *A dog has four legs* and *Dogs have four legs*) sound almost synonymous and share several important semantic properties, there are reports about a number of semantic, pragmatic and distributional differences between them (in e.g. Lawler 1973, Cohen 2001, Greenberg 1998, 2002). In particular, IS sentences (like *A table has four legs* sound more "analytic / definitional" than their minimally contrasting BP counterparts (e.g. *Tables have four legs*), which sound more "descriptive / inductive". Moreover, the distribution of generically interpreted IS sentences is significantly more restricted than that of the minimally contrasting BP ones (as in e.g. Lawler's example *#A madrigal is popular* / / *Madrigals are popular*). Greenberg 2002 such sentences can express two types of nonaccidental generalizations. IS ones can only express „in virtue of“ generalizations, asserting, very roughly, that the generalization is nonaccidentally true in virtue of some property (e.g. having a four legged genetic makeup), which given the shared real world knowledge is associated with the subject property (being a dog). On the other hand BP sentences are ambiguous and can express both „in virtue of“ and „descriptive“ generalizations, where in the latter case they merely assert that the generalization is nonaccidentally true without specifying, or even knowing, the factor in virtue of this is true. ). Unlike most theories, which assign IS and BP sentences an equivalent representation, and several more recent theories, which assign them two completely different representations, in Greenberg 2002 the two types of sentences are assigned a basically uniform - quantificational, modalized - semantic structure, capturing the similarities between them, but the accessibility relation restricting the modalized quantifier are different. That of IS generics is systematically restricted by real world knowledge presuppositions about the subject and VP properties (following Brennan’s 1993 work on root modals), whereas that of descriptive BPs has no such limitations, and is defined, following Lewis’s 1973 notion of maximal similarity, as inherently vague. Although both IS and BP sentences are instances of sentential I-genericity, the compatibility with different accessibility relations is proposed to be derived from the kind / property denoting interpretation of BP and IS noun phrases in them, respectively.

**The basic similarities w.r.t. exceptional and irrelevant entities** Both IS and descriptive BP sentences tolerate four types of entities: exceptional and contextually irrelevant individuals[1], and (when the VP is stage-level) – also exceptional and contextually irrelevant situations. Examples for these are given in (2), for the IS sentence in (1):

***(1) (Context: Talking about this school) – A first grader finishes school at 13.00***

***(2) <u>Irrelevant individuals</u> : John, a first grader from another school. / <u>Exceptional individuals</u> : Bill, a first grader in this school, who finishes school at 12.30 (since he participates in a program for gifted kids which starts at this hour). / <u>Irrelevant situations :</u> A nonschool day (e.g. Saturday) / <u>Exceptional situation -</u> a school day which is extremely cold and stormy.***

In addition, both (epistemic) IS and descriptive BP generics make predictions into <u>actual</u> relevant and nonexceptional entities, and with both type of generics bringing irrelevant - but exceptional - not entities as counterexamples to the generalization is considered a misunderstanding on the side of the listener (or as a serious failure in accommodation).

**<u>Previous approaches</u>** I review several suggestions to deal with the exceptions problem, e.g. Krifka 1995, Asher & Morroeau 1995, and especially Kadmon & Landman's 1993 (K&L, henceforth) suggestion that the set of properties restricting the generic quantifier (which they take to be a nominal GQ) is a vague set. K&L's main intuition is that uttering generics like *<u>An owl hunts mice</u>* „is just like saying "every (possible) owl with the right properties hunts mice", while, crucially not committing yourself to what the right properties are“ (408). Formally, K&L take the restricting set of properties to be a pair $<v_0, V>$, where v, the precise part, is the set of properties supplied directly by the context, whereas V is a set of precisifications of $v_0$, i.e. a set of properties which "represents all the different ways of making the restriction completely precise, which are compatible with what is already known about the restriction in the context" (411).

**<u>Advantages and shortcomings of Kadmon & Landman's suggestion</u>** I show that after adopting K&L's suggestion to a semantic structure with a sentential generic quantifier, it has several important advantages over other approaches to the exceptions problem. It captures in the best way the facts mentioned above, and moreover allows a novel explanation of both the similarities and differences between classic generics (e.g. *<u>Dogs have four legs)</u>* and universal statements on their accidental and nonaccidental reading (e.g. Carlson's 1989 ambiguous example *<u>Every friend of John's votes for Socialists</u>*).

Despite these advantages, however, K&L's characterization of the domain vague restriction makes it, in fact, <u>too vague</u>. I.e. it predicts that „anything goes“ in the restricting set of properties, so there is nothing we can tell about which properties legitimize an exception to a generic sentence and which do not. This prediction is not borne out, since there are several types of systematic limitations on the characterization of legitimate exceptions, made in every context. Two rather minor limitations are that no property v in $v_0$ or in any precisification in V can contain the VP property itself, or its negation. If this limitation is not imposed then we allow a possibility where in some context a listener may take the set of properties restricting Gen in e.g. *<u>A dog has four legs</u>* or *<u>Dog have four legs</u>* to contain the properties "has four legs" or "does not have four legs", thus wrongly leading to the trivial truth or trivial falsehood of such sentences.

While these two restrictions hold equally of IS and BP sentences, and can be easily derived from general conversational maxims of informativeness, there are two further systematic restrictions on the set of properties restricting Gen, which are affected by the specific type of nonaccidentalness, i.e. modality, expressed by the two types of Generic. First, as many researchers (e.g. Krifka et al 1995, Condoravdi 1997, Eckardt 1999) note, the exceptions to generic sentences are considered legitimate (i.e. not falsifying the generic statement) to the extent they are considered „abnormal“, i.e. exceptional in some other sense besides not having the VP property. K&L's theory doesn't captures this since it doesn't impose any limitations on the properties in the vague set V. In

[1] This is contra to claims (by e.g. Dahl 1975, Krikfa et al 1995 and Condoravdi 1997), that unlike quantified statements, generics cannot be contextually restricted.

considering (3a), for example, it wrongly predicts that books with the properties in (3b) (normal properties, that most books have) may be considered legitimate exceptions to (3a), just like books with „abnormal“ properties, as in (3c), i.e. it may wrongly predict (3a) to be true although only a minority of the subject set will have the VP property :

***(3) a. Brown covered books contain an odd number of typos***

***b. containing more than 4 pages, containing less than 3000 pages, printed on paper…***

***c. Being less than 4 pages long, being exactly 257 pages long, printed on silk…***

The final type of systematic limitations on properties legitimize exceptions, those existing with IS sentences, are even stricter. Merely having an „abnormal“ property is not enough to legitimate an exception, e.g. although the proeprties in both (4b) and (4c) are considered „abnormal“ proeprties of sparrows, we take only the ones in (4b) to legitimize exceptions to (4a):

***(4) a. A sparrow has four toes in each leg***

***b. being caught by a cat, undergoing a mutation, participating in some cruel medical experiment…***

***c. having a problem in the vocal cords, reading papers in Semantics, having three names…***

**Solution and implications** – To account for these two further restrictions I suggest to continue using a Kadmon & Landman’s style domain vague restriction, but add two different explicit limitations on the properties in the vague set V, one for descriptive BP sentences and one for IS sentences. Each limitation creates a different type of reduced domain vagueness of the generic quantifier. Crucially, the difference between these two types of reduced vagueness is systematically influenced by the independently motivated difference in modality between IS and descriptive BP sentences, argued for in Greenebrg (2002), i.e. from the difference between the vague, „maximal similarity“ style accessibility relation with descriptive BP sentences, vs. the more specified accessibility relation, keyed to an „in virtue of“ property, with IS one. In descriptive BP sentences, the intuition is that in any context c the only requirement on the properties legitimizing the exceptional is they are not „normal“. In contrast, in any context c, the exceptions to IS sentences like (4a) are only those with properties which, given our real world knowledge, are taken in that context c, to block the normal causation relation between the „in virtue of“ property associated with the subject property , and the VP property (e.g. block the natural outcome of „having a genetic makeup for four toes“). Thus, with descriptive BP sentences we merely require that in any context, the number of individuals who have the properties in any of the precisifications in $v\text{-}v_0$ in V is not significantly smaller than the number of relevant individuals quantified over. In contrast, with IS sentences we require that each property in any set of precisification $v\text{-}v_0$ in V is a member of the complement set of properties which in the world of evaluation are taken block the normal causation relation between the „in virtue of“ and the VP properties.

I discuss the degrees and sources of the two types of reduced vagueness with the two types of generics, and compare them to the degree and source of reduced vagueness of free choice *any*, under K&L's analysis, and the modifiability of all these elements by e.g. *almost*. I compare my analysis with that of Eckardt's 1999 suggestion to solve the exceptions puzzle by positing a "normal" restriction on the subject (and possibly object) set of individuals. Although "normal" is a vague adjective I claim that the present development of K&L's analysis does a better job in capturing the vagueness of generics (among other things since in Eckardt's use "normal" is a vague first order modifier, whereas in the present theory the restriction can be defined in terms of second order modification. Time permitting I will comment on the implications for formalizing distinctions in natural language vagueness in general (such as vague restrictions on quantifier vs. modification by vague adjectives, first and second order vagueness, vagueness of first or second order predicates, degrees of vagueness, etc.).

Selected References: Brennan, V. (1993), „Root and Epistemic Modal Auxiliary Verbs“, Ph.D. dissertation, Umass., Amherst./ Cohen, A. (2001) „On the Generic Use of Indefinite Singulars“. Journal of Semantics 18:183-209. / Condoravdi, C. (1993), „Weekly and Strongly Novel Noun Phrases“, in **Proceedings of the 11th. WCCFL**./ Eckardt, R. (1999), „Normal Objects, Normal Worlds, and the Meaning of Generic

Sentences“, **Journal of Semantics, 16:**237-278, Oxford University Press./ Greenberg, Y. (2002) „Two Kinds of Quantificational Modalized Genericity, and the Interpretation of Bare Plural and Indefinite Singular NPs“, the SALT 12 international conference, (UCSD). / Kadmon, N. and F. Landman (1993) „Any“, Linguistics and Philosophy_16:353-422. / Krifka, M. (1995), „“Focus and the Interpretation of Generic Sentences“ in G. Carlson and F.J. Pelletier (eds.) The Generic Book, The University of Chicago Press, Chicago.

# SUPERLATIVE QUANTIFIERS AND THE DYNAMICS OF CONTEXT DEPENDENCE

The sentence in (1) is ambiguous:

(1) John climbed the highest mountain.

Following Szabolcsi (1986), Heim (1985), Farkas and Kiss (2000), and Sharvit and Stateva (2002), we call the two readings of (1) the **absolute reading** and the **comparative reading**. In the first reading (1) is interpreted as 'John climbed a mountain higher than any other mountain', and in the second as 'John climbed a higher mountain than anybody else climbed'. In this paper, it is claimed that there is no ambiguity in the interpretation of superlatives. The two readings are a by-product of the context dependent nature of superlative definite descriptions. Following Groenendijk, Stokhof and Veltman (1995) and Heim (1996), superlatives are treated as definite determiners inherently restricted by a context set C (Westerståhl 1985; von Fintel 1994), as in (2).

(2) $[\![the\ highest\ mountain]\!] = \lambda C \lambda P.\iota x \in C\, \exists d[mountain(x) \wedge high(d)(x) \wedge P(x) \wedge \neg \exists y \neq x \in C[mountain(y) \wedge high(d)(y) \wedge P(y)]]$

The determination of the composition of the context set is conditioned by three factors operating at the semantics/pragmatics interface: (i) the dynamic semantics of connectives (Chierchia 1995), (ii) presupposition accommodation (Groenendijk, Stokhof and Veltman 1995) and (iii) focus (Szabolcsi 1986). These factors interact with the dynamics of context sets in discourse as they restrict the definite determiner and the superlative operator. A proposal along this lines makes unnecessary treating the definite determiner heading superlative descriptions as a covert indefinite (as Sharvit and Stateva 2002 do). Consider (3):

(3a) When John was in France, he climbed the highest mountain.
(3b) I bought thirty books last month. I shouldn't have bought the most expensive one.

In (3a) the context set C of the description *the highest mountain* has to be $\lambda x[In_France(x)]$, since the dynamic semantics of conditionals requires that all discourse updates incorporating the propositional content of the consequent ("nuclear scope") have to satisfy the conditions introduced by the antecedent clause ("restrictor"). Similarly, in (3b) by the semantics of dynamic conjunction, the value of C is $\lambda x[book(x) \wedge last_month(buy(x)(I))]$. This is not sufficient: the presupposition that the books are not equally expensive has to be accommodated after processing the second sentence in order to get a felicitous discourse.

In focus structures, the context set is determined by the focus value/presuppositional skeleton (Rooth 1992; Kratzer 1991) of the remnant of the sentence where the focus marked constituent occurs after the operation of Quantifier Raising (QR) has applied to the superlative description —cf. Heim 1996, 2000 (cf. also Farkas and Kiss 2000 for an alternative analysis without syntactic movement ). First, the focus value A of the relevant subexpression $\alpha$ is calculated after QR; and then the context set C is given as $\lambda x \exists y[A(y)]$, where the type of the variable y is the type of the members of A.

Consider the contrast between (4) and (5):

(4) John$_F$ climbed the highest mountain.
(5) John climbed the highest mountain yesterday$_F$.

In (4) after QR the focus value of *John$_F$ climbed x* is $\lambda z[climb(x)(z) \wedge z \in ALT(j)]$, where ALT(j) is the set of contextually relevant alternatives to the individual John in the model. The context set restricting the superlative definite description is, after $\lambda$-reduction, $\lambda x \exists y[climb(x)(y) \wedge$

$y \in ALT(j)]$, i.e. the set of entities that any individual under consideration climbed. When the temporal adverb *yesterday* in (5) is focused, a "comparative" interpretation arises in which the context set is the set of mountains that were climbed in the period under consideration (the set of alternatives to *yesterday*). In this case the focus value of *John climbed x yesterday*$_F$ has to be calculated, which is $\lambda M[M(climb(x)(j)) \wedge M \in ALT(yesterday)]$, where M is a modifier variable. The context set restricting the superlative definite description is C = $\lambda x \exists M[M(climb(x)(j)) \wedge M \in ALT(yesterday)]$, which gives us the intended reading.

Szabolcsi (1986) also observes that in existential-*there* constructions only the comparative reading is allowed, as shown by the contrast in (6).

(6a) *Yesterday there were the fewest guests.
(6b) There were the fewest guests yesterday$_F$.

Existential sentences obligatorily introduce non-dependent or free discourse referents (Kamp and Reyle 1993). As a consequence, the context set of the description is empty in (6a) and the description fails to refer—the intersection of the denotation of the descriptive part with the empty set is always empty. In (6b), the content of the context set is provided not by the previous discourse but by accommodation of the content of *there were x yesterday*$_F$ as above, yielding the context set C = $\lambda x \exists M[M(Thing(x)) \wedge M \in ALT(yesterday)]$, i.e. the set of individuals under consideration in ALT(yesterday).

This analysis of superlative quantifiers is extended to deal with a variety of related structures: superlatives in embedded contexts, in the scope of intensional verbs, and in questions. In the latter case, the nature of the embedding verb and of the domain associated with the wh-word trigger interpretive variation. A difference can be detected between *believe*-type verbs and *say*-type verbs. The former give rise to two comparative readings whereas the latter only have one. Following Davidson (1968), it can be assumed that the complements of the verbs of the second type are not structured (they would stand for *that*-demonstratives) whereas the first type of verbs embed propositional complements that are syntactically structured. Then, the calculation of the context set does not have access to the embedding verb *say*.

Similarly, *why*- and *how*-questions lack comparative readings based on the *wh*-word. The sentence *Why did you read the longest book?* lacks the comparative reading 'For what reason did you read a book longer than the books you read for any other reason?'. The only comparative reading possible is 'For what reason did you read a book longer than any other book?'. In general, a context set cannot be formed taking as a basis the set of alternatives in MANNER or REASON. Szabolcsi and Zwarts (1993) claim that the set of manners and reasons has the structure of a join semi-lattice. Therefore, it is not closed under complements or meets. Yet the computation of the set of alternatives requires precisely taking into consideration the complement of a certain entity.

In summary, the integration of dynamic processes with the semantics of definites and comparatives/superlatives allows for a reexamination of the different readings of superlatives and a uniform dynamic account.

## References

Chierchia, Gennaro. 1995. *Dynamics of Meaning*. Chicago: University of Chicago Press.
Davidson, Donald. 1968. ' On saying *that*', *Synthese* 19, 130-146.
Farkas, Donka, and Kathalin Kiss. 2000. 'On the comparative and absolute readings of superlatives', *Natural Language and Linguistic Theory* 18, 417-455.

Groenendijk, Jeroen, Martin Stokhof and Frank Veltman. 1995. ‘Coreference and contextually restricted quantification.’ *Proceedings SALT V*, 112-129.

Heim, Irene. 1985. ‘Notes on comparatives and related matters’, ms. University of Texas at Austin.

Heim, Irene. 1996. ‘On the logical syntax of degree operators’, ms. MIT.

Heim, Irene. 2000. ‘Degree operators and scope’, *Proceedings SALT X.*

Kamp, Hans and Reyle, Uwe. 1993. *From Discourse to Logic.* Dordrecht: Kluwer Academic publishers.

Kratzer, Angelika. 1991. ‘The representation of focus’ in Arnim von Stechow and Dieter Wunderlich (eds.), *Semantics: An International Handbook of Contemporary Research.* Berlin: De Gruyter, 804-825.

Rooth. Matts. 1992. ‘A theory of focus interpretation’, *Natural Language Semantics* 1.1, 75-116.

Sharvit, Yael, and Penka Stateva. 2002. ‘Superlative expressions, context, and focus’, *Linguistics and Philosophy* 25, 453-504.

Szabolcsi, Anna. 1986. ‘Comparative superlatives’, *MIT Working Papers in Linguistics* 8, 245-265.

Szabolcsi, Anna, and Frans Zwarts. 1993. ‘Weak islands and an algebraic semantics for scope taking’, *Natural Language Semantics* 1, 235-284.

Von Fintel, Kai. 1994. *Restrictions on Quantifier domains.* Ph.D. thesis. UMAss.

Westerståhl, Dag. 1985. ‘Determiners and context sets’, in Johan van Benthem and Alice ter Meulen (eds.), *Generalized Quantifiers in Natural Language.* Dordrecht: Foris.

# Type Shifting of Entities in Discourse

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**Overview.** Clauses denoting propositions, facts, and reasons share a suite of semantic properties. These implicate a higher semantic type for clausally-introduced propositions, facts, and reasons, than for their counterparts introduced by nominals, which are of type e. Clausally introduced events are also of type e. The present talk does two things: (1.) It extends these results to properties; and, (2.) it shows that the semantic type of a clausally introduced proposition, fact, reason, or property shifts to type e upon subsequent mention, with observable effects on the entire suite of properties indicating higher type. The semantic type of an entity depends on the linguistic expression used to refer to it, and can vary during discourse with successive referential acts.

When propositions, facts, and reasons (including purposes) are introduced into a discourse by a clause, they are more readily accessible to immediate subsequent reference with demonstrative pronouns and demonstrative noun phrases, than they are to reference with personal pronouns such as *it*; see Webber (1988), Webber (1991), Gundel, Hedberg and Zacharski (1993), Borthen, Fretheim and Gundel (1997), Gundel, Borthen and Fretheim (1999), and Hegarty, Gundel and Borthen (2002), among others. In (1), the proposition that the cognitive mechanisms responsible for mathematical concepts are also responsible for ordinary ideas can be felicitously referred to by the demonstrative pronoun, but not the personal pronoun. In (2) (from Hegarty, Gundel and Borthen 2002), the demonstrative, but not the personal pronoun, can felicitously refer to the fact that the court does not believe Ms. Lewinsky. Likewise for reasons (3a), and purposes (3b). But events (4) introduced by clauses are immediately accessible to reference with *it*.

(1) For more sophisticated [mathematical] ideas, it is necessary to study the cognitive mechanisms that characterize mathematical concepts. Lakoff and Nuñez argue that these are the same ones that characterize ordinary ideas. **This** leads to the authors' main thesis—that mathematics develops by means of metaphors. (Auslander, Joseph. 2001. *American Scientist* 89:366.)
versus: # **It** leads to the authors' main thesis….

(2) "We believe her, the court does not, and **that/#it** resolves the matter," Mr. Montanarelli said today of Ms. Lewinsky's testimony that she had an independent recollection of the date. (*New York Times*, May 24, 2000)

(3) a. Jill fired Fred because he had made inappropriate remarks to his co-workers. **That/#it** is the reason listed on the personnel forms.
b. The company hired Susan to create web pages. **That/#it** is the purpose they specified in the job announcement.

(4) John broke a priceless vase. **That/it** happened at noon.

Furthermore, propositions, facts, and reasons introduced by a nominal expression are rendered immediately accessible to reference with a personal pronoun. Contrast (5)-(7) below with (1)-(3) above.

(5) Alex then introduced a new proposition. But **it** was immediately pooh-poohed.
(6) At that moment, another fact struck Maria. **It** sent shivers down her spine.
(7) Jill fired Fred for a valid reason. **It** was that he made inappropriate remarks to his co-workers.

These observations can be framed in terms of the cognitive statuses defined within the Givenness Hierarchy of Gundel, Hedberg and Zacharski (1993). They propose that a determiner or pronominal form signals that the referent of the associated nominal is assumed by the speaker or writer to have a particular cognitive status (memory and attention state) for the addressee. Of relevance here are the statuses labeled ‘activated’ and ‘in focus’. An entity is activated for a participant in a discourse if that person has a representation of it in short term (or working) memory; and an entity is in focus for a participant if it is activated and, moreover, at the center of that person’s attention. The personal pronoun *it* is used by a speaker or writer only when the referent can be assumed to be in focus for the addressee prior to processing of the referring form. Demonstratives *that* and *this* are used when the referent can be assumed to be at least activated (while it may or may not be in focus) prior to processing of the referring form.

If we suppose that clausally introduced entities are rendered activated, but not in focus, upon their introduction, then delineation of these different cognitive statuses provides a preliminary explanation of the data in (1)-(7). An entity will be in focus only if it has been mentioned by a nominal expression in a prominent syntactic argument position earlier in the utterance or in the previous utterance. This accounts for (1)-(3) and (5)-(7). (4) indicates that events are immediately rendered in focus upon their introduction into a discourse, even when they are introduced by a clause.

Recent literature (Hegarty 2003) shows that the possibility of immediate reference with a personal pronoun, described above, varies inversely with the possibility of coordination as a singular sum. A coordination of clauses introducing propositions, facts, and reasons can be interpreted as denoting a single, more complex, proposition, fact, or reason, supporting subsequent reference with a singular demonstrative pronoun or NP. (Similar facts, regarding singular agreement upon coordination of *that*-clauses, were noted by McCloskey 1991 and Moltmann 1997.) But a coordination of nominal expressions denoting propositions, facts or reasons can only be interpreted as a plural. To illustrate with reason clauses (8) versus nominals (9):

(8) Susan fired Bill because she needed to trim the budget and (because) he had the largest salary on the staff. This was a legitimate reason.
(9) To justify firing Bill, Susan cited the need to trim the budget and the excessive size of Bill’s salary. #This was a legitimate reason. / These were legitimate reasons.

In contrast to (8), a coordination of clauses introducing independent events (not components of a single, larger event) behaves strictly as a plural.

A parallel to the coordination pattern is obtained in possibilities for quantification by a quantity adverb. To illustrate, the adverb *mostly* in (10) below can quantify over a discourse-appropriate propositional content.

(10) A: What does Jill think about the incident at the nuclear plant?
B: Mostly, Jill believes that the plant was on the brink of a meltdown.

Putting aside the extraneous interpretation in which *mostly* modifies the degree of Jill's belief, and identifying part-whole structure in line with the semantics of amount quantifiers (see Lahiri 2000, 2002), the whole at issue in (10) is the propositional content of the body of Jill's beliefs pertaining to an incident at the nuclear plant, while the part at issue is the propositional content of the subordinate clause. This yields a quantity adverb interpretation of (10) as asserting that the greater part of Jill's beliefs pertaining to the incident can be summed up in the proposition that the plant was on the brink of a meltdown. In a parallel example with a nominal complement of the verb, as in (11), *mostly* can quantify over degrees of Jill's belief, but (11B) does not assert that the propositional content of Jill's beliefs about the incident consists mostly of the proposition denoted by the direct object.

(11) A: What does Jill think about the incident at the nuclear plant?
B: Mostly, Jill believes the proposition Sam believes.

It can be shown that the semantic type s, t for clausally introduced propositions, facts, and reasons yields unsatisfactory explanations both for their coordination as a singular sum, and for quantification over their domains by quantity adverbs. However, satisfactory accounts of these facts are obtained (Hegarty 2003) if these entities are type raised to type s, t , t when they are introduced by a clause. Let = $P$, , , ¬ be the standard Boolean algebra on propositions, defined in terms of the connectives of propositional logic, and define a partial linear ordering ≤ on $P$ in terms of entailment. Given a clause α, and the proposition $p$ recovered directly from the predicate-argument and quantificational structure of α, let the denotation of α be the principal ultrafilter $F_p$ generated by $p$ under the partial order, ≤.

(12) $[|\alpha|] = F_p = \{r : p \leq r\}$.

It follows that, for any propositions $p, q$ $P$, $F_p \cap F_q = F_{p \vee q}$. As Winter (2001) notes in a similar context, this permits a strictly Boolean interpretation of coordination, but one with the effects of proposals for non-Boolean coordination as a singular sum. Furthermore, it can be shown that (12) yields a realistic account of the quantity adverb interpretation of (10B).

Propositions, facts and reasons introduced by a nominal expression do not follow suit since they are of type e. Furthermore, events are of type e even when introduced by a clause due to Davidsonian interpretive procedures which automatically introduce a first-order variable for the event or state described by a clause, as discussed by Higginbotham (1985, 1989, 2000).

The present work extends these results in two directions: by bringing properties into the fold, and by examining what happens to the semantic types of entities upon further mention in a discourse.

We can observe that properties are only activated upon their introduction. Upon further mention, they are rendered in focus.

(13) The electrical poles are perfectly spherical.
That/#it is how the calculation requires them to be.

(14) Max is taller than the linemen.
That/#it is what we want in a quarterback.

(15) A: Susan is as smart as Einstein.
B: That's smarter than anybody else in the program. It's even smarter than Max.

Furthermore, they coordinate as a singular sum (16)-(17), and are subject to quantity adverb quantification over their domain (18), where *mostly* can quantify over the bulk or extent of Max's relevant properties in the context at hand.

(16) Max is tall and strong. That is what we want in a player.

(17) Susan is taller than a typical guard, and as strong as most forwards. That is rare.

(18) Mostly, Max is attentive to details.

By any account, properties are of higher type, mininally, e, t . To account for the above facts, properties introduced by APs (rather than nominals) are type-raised to type e, t , t , by defining them as principal ultrafilters under the partial linear order defined by entailment, ( $x$)[$Px \rightarrow Qx$]. Properties denoted by nominals are of type e. Of course, this recapitulates, in different terms, Frege's (1892) observation that the nominal *the predicate 'red'* is not coreferential with the predicate term *red*, and likewise (with only apparent paradox), that the concept 'horse' is not a concept.

**Type change of entities in discourse.** This is exhibited in (15) above, and in (19) below.

(19) A: Alex believes that Bill stole the artifact.
B: **That** is implausible. **It** would entail that Maria was in on the scam,
and we know that she wasn't.

What does this tell us about in-focus, as opposed to activated, entities?

**Hypothesis 1.** In focus requires spatio-temporal delimitation.

This is shown to be wrong: propositions introduced by a nominal are in focus, as are propositions after a second mention in a discourse, yet they do not have spatiotemporal bounds, any more than propositions introduced by a clause.

**Hypothesis 2.** In focus requires full comprehension.

The idea is the following: The interpretation of a clause as a principal ultrafilter must be wielded in a psychologically plausible way. If *John believes* β, where β is interpreted as $F_p$, then some of the entailments in $F_p$ will be cognitively accessible to John, and some will not be. From *John believes* β, it certainly doesn't follow that John automatically believes all entailments of *p* in C; it can only mean that he believes the generating proposition and those entailments which are cognitively accessible to him. As a result, there is a grading off in ramifications: if John believes that Bill stole the artifact in a context C, it follows that he believes the artifact was stolen, but he may not realize that Bill could not have stolen the artifact without Mary's help, even if this necessarily follows within C.

But Hypothesis 2 is also shown to be wrong. A shadowy individual, about whom the participants in a discourse know little, can be in focus, and referred to with a personal pronoun. Furthermore, the principal ultrafilter $F_p$ of a proposition, fact, or reason does not become more

fully comprehensible or psychologically accessible upon further mention with a nominal expression, yet such further mention renders the referent in focus, as in (19).

**Hypothesis 3.** Only entities of type e can be in focus.

That is, only elements of type e are admitted into the center of attention. Higher typed entities, even if introduced in prominent syntactic positions, are not admitted to the center of attention. In (19), use of *that* effects a type update: the type of the proposition,  s, t , t , changes to type e upon use of *that* to refer to the proposition. Since the proposition is in short-term memory and at the center of attention, it is rendered in focus upon type change to type e.

How does type-shifting work? It won't do to take the generating member of the ultrafilter as the shifted type since the generator is already of higher type than e, specifically, of type  s, t  for propositions, and  e, t  for properties. Note that for propositions, type-shifting can't even be construed as type-lowering since the higher type doesn't contain e. A new elementary individual of the discourse is created, of type e.

If type-shifting is correct, it should be revealed by the diagnostics used above. It has already been observed that further mention permits reference with a personal pronoun. Check for coordination as a singular sum, versus only as a plural:

(20) Jill believes that Max embezzled from his division. Alex believes that Susan used insider knowledge to purchase stocks. The first claim and the second claim have been reported to the president and to the SEC.
a. They are likely to be true.
b. # It is likely to be true. [it = that Max embezzled and that Susan did insider trading]

In (20), following the introduction of the two propositions, subsequent coordination of nominals denoting these propositions, *the first claim* and *the second claim*, does not set up reference to a singular sum. Check quantification by a quantity adverb:

(21) A: What does Jill think about the incident at the nuclear plant?
B: Mostly, Jill believes that the plant was on the brink of a meltdown.
A: I believe that myself. Mostly, Sam believes it too. / Sam mostly believes it too.

In B's response, *mostly* can quantify over the body of Jill's beliefs about the incident; this yields an interpretation of (21B) as asserting that the greater part of Jill's beliefs pertaining to the incident can be summed up in the proposition that the plant was on the brink of a meltdown, and its ramifications. But in A's rejoinder, *mostly* can only modify Sam's intensity, certainty, or degree of belief. It can't assert that the greater part of Sam's beliefs about the incident are summed up in the proposition referred to by *it*.

**Summary.** Clausally introduced propositions, facts, reasons, and properties have a higher type than the ones standardly associated with these entities. But upon being entered into a discourse, these entities do not retain their higher types; with subsequent nominal mention, the type of such an entity reverts to type e, the type of an ordinary individual. Effectively, the entity becomes a peg, in the sense of Landman (1986), no matter how exotic or complex its original type in the discourse.

**Selected Recent References**

Gundel, Jeanette K., Kaja Borthen and Thorstein Fretheim. 1999. The role of context in pronominal reference to higher order entities in English and Norwegian. In P. Bouquet et al (eds.). *Modeling and using context. Lecture notes in Artifical Intelligence.* Berlin: Springer Verlag.

Hegarty, Michael, Jeanette K. Gundel and Kaja Borthen. 2002. Information structure and the accessibility of clausally introduced referents. *Theoretical Linguistics* 27(2-3):163-186.

Hegarty, Michael. 2003. Semantic types of abstract entities. To appear in *Lingua*.

Lahiri, Utpal. 2002. *Questions and Answers in Embedded Contexts*. Oxford: Oxford University Press.

Moltmann, Friederike. 1997. *Parts and Wholes in Semantics*. Oxford: Oxford University Press.

Winter, Yoad. 2001. *Flexibility Principles in Boolean Semantics: The Interpretation of Coordination, Plurality, and Scope in Natural Language*. Cambridge, MA: MIT Press.

## MATCHING THE CONSTITUENCY OF QUANTIFICATION AND SENTENCE STRUCTURE: TWO CASE STUDIES FROM MANDARIN CHINESE

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While it is no longer necessary to point out the fruitfulness of the tripartite structure approach to quantification, not all areas within the fence set by this theory have yet been populated. This presentation will colonize two of these unpopulated spots with hitherto underinvestigated phenomena from Mandarin Chinese.

The first phenomenon concerns information-structure and, more accurately, obligatory background marking. The special thing about Chinese background marking is that, given certain structural conditions, it is (i) obligatory and (ii) paradigmatic. The sentences in (1) illustrate both of these properties.

| (1) | a. | *Zhǐyǒu* | *ZHÈ-zhǒng* | *shū* | *Lǎo Wáng* | **(cái)* | *mǎi-guo.* | | |
|---|---|---|---|---|---|---|---|---|---|
| | | only | this-CL:kind | book | Old Wang | CAI | buy-ASP | | |
| | | 'Old Wang has bought only THIS kind of book before.' | | | | | | | |
| | b. | *Jiùshì* | *NǏ* | *LÁI,* | *wǒ* | **(yě)* | *bù* | *huì* | *qù.* |
| | | even.if | you | come | I | YE | not | will | go |
| | | 'Even if YOU COME, I will not go.'/'If YOU COME, I still won't go.' | | | | | | | |
| | c. | *Lián* | *TĀ* | **(dōu)* | *huì* | *lái.* | | | |
| | | even | (s)he | DOU | will | come | | | |
| | | 'Even (S)HE will come.' | | | | | | | |
| | d. | *Zhǐ-yào* | *NǏ* | *LÁI,* | *wǒ* | **(jiù)* | *qù.* | | |
| | | only-must | you | come | I | JIU | go | | |
| | | ≈ 'If YOU COME, I'll go.' | | | | | | | |

All sentences in (1) have focused constituents in small caps with specific focus quantificational meanings: (1a) precludes the truth of any relevant alternative sentence, (1b) presupposes the truth of at least one alternative sentence (the existential second translation is more accurate in this respect), (1c) makes a universal statement concerning alternatives, and (1d) presupposes that not all alternatives are true. Apart from the fact that negated universal quantification over alternatives, as postulated for (1d), has, to the best of my knowledge, never been proposed as a lexically encapsulated focus quantificational notion, the complete coverage of the relevant domain is special (albeit theoretically expected from the point of view of quantificational focus theories and Löbner's 1990 findings concerning the design of quantificational lexical paradigms): Each of the four classic quantificational types is represented by (1a-e). The paradigm of focus-related expressions in (1) thus covers the complete semantic space that is relevant in this domain. The obligatoriness of *cái*, *yě*, *dōu* and *jiù* in (1) constitutes the second peculiarity of the discussed Mandarin system. The underlined focus markers *zhǐyǒu*, *jiùshì*, *lián* and *zhǐyào* precede and c-command their interacting foci, whereas obligatory *cái*, *yě*, *dōu* and *jiù* follow their interacting foci. Thus, while the obligatory particles covary with the quantificational type of focus, they do not seem to partake in the focus marking itself (otherwise we would expect them to c-command their foci). Instead, they occur in a fixed position probably immediately above AspP or some non-epistemic modal projection (Shyu 1996). The material following the particles invariably belongs in the presupposition of the focus-background structure, so I take the particles to constitute an agreement phenomenon: The quantificational type of the focus is reflected in the background. Since the focus-background partition may be subsumed under a general notion of subject-predicate partitionings, and since syntactic subjects are typical agreement triggers, the postulated Mandarin agreement system is not fully unexpected. The only unexpected property of the system is that the agreement is not realized within morphology, but, at best, as a case of pro-cliticization. The four particles in (1) are the core members of the investigated paradigm of conventionalized background markers in Mandarin. Even though all four quantificational types are covered

by them, at least two more members of the paradigm can be identified: *hái* (basic meaning 'still') and *zài* (basic meaning 'once more'). (2) and (3) illustrate their use as focus agreement markers.

(2) *Bāo-shang* LIĂNG-*kuài* *hóng-bù,*
wrap-up 2-CL:piece red-cloth
*hái* *zhĭbuzhù* *xué* *ne.*
HAI unable.to.stop blood PRT
'Even wrapping it up with TWO pieces of red cloth could not stop the bleeding.'

(3) *Wŏ* HUÍQÙ KĂOLǛ YĪ-XIÀ, *wŏ* *zài* *gàosu* *nĭ* *zĕnme* *bàn.*
I return ponder 1-CL:bit I ZAI tell you how handle
'I'LL RETURN HOME AND THINK ABOUT IT, and (only) THEN {will I/I'll} tell you what to do.'

*Hái* as an agreement particle is claimed to inherit from its basic use as 'still' (i) the existential quantification over alternatives (some alternative is true) and (ii) the scalar, though not necessarily temporal, ordering of the alternatives such that the considered alternative focus values are lower on the relevant scale. Property (i) makes agreement-*hái* a more special variant of agreement *yĕ* (cf. (1b)). Property (ii) restricts the use of agreement-*hái* in such a way that its use in negative polarity contexts is excluded, because in negative polarity contexts only higher scalar values are considered. In this kind of context, agreement-*yĕ* still is a good option; cf. (4).

(4) *Wŏ* *tóu* YĪ-DIĂNR *{yĕ/*hái}* *bù* *tòng.*
I head 1-CL:bit YE/HAI not hurt
'My head doesn't hurt THE SLIGHTEST BIT/AT ALL.'

My proposal for *zài* as an agreement particle says that the domain of quantification is restricted to a single alternative, and this alternative is excluded. This makes the difference between quantification of type $\neg\forall$ and $\neg\exists$ vanish. The disappearance of the difference between these two quantificational types, which results from the cardinality restriction of the domain, is unelegantly mirrored by the two-fold translation into English, one of them signalling $\neg\exists$-quantification, the other one coming close to signalling $\neg\forall$-quantification over alternatives. The restriction of the set of alternatives to a cardinality of 1 is not reflected in the translation.

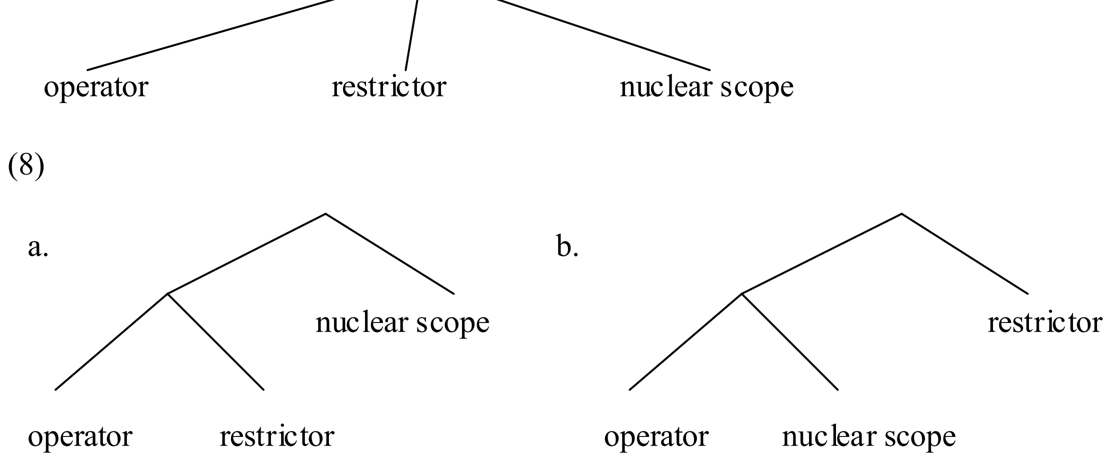
The second case study concerns the mapping of modal quantificational structures to syntactic structures. It draws heavily on Kratzer's (1981, 1991) theory of modality, and on Partee's (1995) ideas concerning the constituency of quantificational structures. The problem is nicely illustrated by the sentences in (5) and (6).

(5) *Tā* *bìxū* *qù* *dàshĭguăn,* *cái* *néng* *shēnqĭng* *qiānzhèng.*
(s)he must go embassy CAI can apply.for visa
'(S)he must go to the embassy to be able to apply for a visa.'/
'Only if (s)he goes to the embassy can she apply for a visa.'

(6) *Tā* [*bìxū* *xià* *yŭ*] *cái* *lái.*
(s)he must fall rain CAI come
'It must rain in order for him/her to come.'/'Only if it rains does (s)he come.'

Upon first inspection, (5) seems to be an average complex *cái*-sentence, a sentence type typically rendered by *only-if*-conditionals in English (for a simple *cái*-sentence cf. (1a)): The first conjunct delimits the set of situations within which the second conjunct is true, and no other possibilities exist. The problem has to do with the use of *bìxū* 'must' in (5). If we render the sentence as an *only-if*-conditional in English without omitting this modal verb, we get a wrong translation: *Only if (s)he has to go to the embassy can (s)he apply for a visa*. The obligation to go to the embassy doesn't, of course, influence the outcome, it is only the question of going or not going to the embassy that matters. If we want to retain the modal verb in our translation, we must resort to a purposive construction as in the first translation of (5). If we

prefer a conditional construction, we must drop the modal of necessity. In case we decide in favour of a purposive construction, we face the problem that the facts of syntactic dominance are switched: In the first translation of (5), the main clause precedes the subordinate purpose clause, but in the Mandarin sentence the first clause is subordinate. The same dilemma can be stated for (6): The subordinate clause *bìxū xià yǔ* 'must fall rain' contains a modal of necessity with wide scope, and a literal translation that captures both the facts of syntactic subordination and the scope of the modal is impossible (the sentence does not mean 'Only if it must rain does (s)he come').
Three analyses that might come to mind are shown not to solve the problem. The first of these analyses would say that there is an implicit anaphor representing the subordinate clause minus the modal in the matrix clause, much like *then* in *She must go to the embassy, only then can she apply for a visa* does, except that *then* in the English sentence is not implicit. The strongest argument against this analysis is derived from the fact that the subordinate clauses in the Mandarin sentences may not be dropped, while this is generally possible if an overt anaphor is used. The second analysis would propose a reanalysis of the modal operators. The modal operator *bìxū* 'must' might be said to have undergone reanalysis such that, in this construction, it is interpreted as a conjunction or complementizer. It is, however, generally possible to use just any modal of necessity in the relevant construction, which would mean that all and only the synchronically available modals of necessity have previously been reanalyzed as conjunctions or complementizers. This is not a very attractive theory. Moreover, speakers' intuitions insist on the status of *bìxū* etc. in the relevant construction as modal verbs. The third possibility would be to say that Mandarin, instead of embedding purpose clauses, embeds means clauses. The drawback of this analysis is the fact that the modal would still have to take matrix scope, thereby rendering this idea unattractive as well.
The solution to the puzzle that I favour makes use of an unorthodox mapping from constituents of modal quantification to sentence structure. If modal structures can be represented as quantificational structures, and if there is no logically pre-established binary branching opposing the quantifier together with the restrictor to the nuclear scope, then it should also be possible to find the quantifier and the nuclear scope forming a constituent, with the restrictor being opposed to it (Partee 1995). The diagram in (7) depicts the flat logical structure of tripartite structures; (8a) gives a binary constituency reflecting the way we tend to think about the constituency of quantification in familiar natural languages, especially in the domain of generalized quantifiers; (8b) is the alternative binary branching that I will apply to the Mandarin case.
(7)




If we analyze the main clauses of the Mandarin sentences in (5) and (6) as restrictors, i.e. as accessibility relations or specifications of the circumstantial ordering source, everything falls into place. (9) (=(5)) may, in simplified possible-worlds terms, then be paraphrased as in (10).

(9) *Tā bìxū qù dàshǐguǎn, cái néng shēnqǐng qiānzhèng.*
(s)he must go embassy CAI can apply.for visa
'(S)he must go to the embassy to be able to apply for a visa.'/
'Only if (s)he goes to the embassy can she apply for a visa.'

(10) '[All]$_{\text{QUANTIFIER}}$ the possible worlds which are [such that (s)he can apply for a visa]$_{\text{RESTRICTOR}}$ are [such that (s)he goes to the embassy]$_{\text{NUCLEAR SCOPE}}$.'

If we take the language-independent flat structure of quantification seriously, we expect to find phenomena which implement modal quantification syntactically the way the discussed Mandarin structure does. After all, *if*-sentences with explicit adverbial quantifiers (*If the sun shines, I sometimes go jogging*) have the same quantificational constituency, the only difference being that the restrictor in such sentences is syntactically subordinate.

References:


Kratzer, Angelika (1981). 'The notional category of modality'. In: Hans-Jürgen Eikmeyer & Hannes Rieser (eds). *Words, Worlds, and Contexts. New Approaches in Word Semantics*. Berlin: de Gruyter, 38–74.

Kratzer, Angelika (1991). 'Modality'. In: Arnim von Stechow & Dieter Wunderlich (eds) (1991). *Semantik/Semantics. Ein internationales Handbuch der zeitgenössischen Forschung/An International Handbook of Contemporary Research*. Berlin & New York: de Gruyter, 639–50.

Löbner, Sebastian (1990). *Wahr neben falsch. Duale Operatoren als die Quantoren natürlicher Sprache*. Tübingen: Niemeyer.

Partee, Barbara H. (1995). 'Quantificational structures and compositionality'. In: Emmon Bach, Angelika Kratzer & Barbara H. Partee (eds). *Quantification in Natural Languages*. Dordrecht: Kluwer, 541–601.

Shyu, Shu-ing (1995). 'The syntax of focus and topic in Mandarin Chinese'. *Doctoral dissertation*. University of Southern California at Los Angeles.

# The Border Wars: a neo-Gricean perspective

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Abstract for the International Workshop "Where Semantics Meets Pragmatics"
Michigan State University, July, 11-13, 2003

I will be filing reports from several fronts in the semantics/pragmatics border wars. I will seek to bolster the loyalist (neo-)Gricean forces against various recent revisionist sorties, including (but not limited to) the Relevance-theoretic (e.g. Carston 2002) view on which the maxims (or more specifically their sole surviving descendant, the principle of relevance) inform truth-conditional content through the determination of "explicatures", the Levinson (2000) position on which implicatures can serve as input to logical form, a recent argument by Mira Ariel (2003) for a semantic treatment of the upper bound ("not all") for propositions of the form "Most F are G", and Chierchia's (2001) proposal to reanalyze implicatures as part of grammar. I will make the case for continuing to draw the semantics/pragmatics boundary along relatively traditional lines, maintaining a constrained characterization of "what is said", while adopting a variant of Kent Bach's "impliciture" for the unexcluded middle lying between the borders of what is said and what is implicated. I will also support the Gricean conception of implicature as an aspect of speaker meaning, as opposed to its reconstruction in terms of default inference or utterance interpretation, as in much recent work on pragmatics.

In this presentation, I will revisit the the argument (cf. Horn 1992, Geurts 1997, Ariel 2003) for distinguishing cardinal values from other scalar predicates. I will also survey current controversies attending to the meaning and acquisition of disjunction and other scalar operators (Cherchia et al. 2001), the nature of subcontrariety and its implications for lexicalization (e.g. the constraint against lexicalizing not all), and the status of polarity licensing within the innateness controversy (cf. Crain & Pietroski 2002). In each case, I will seek to emphasize the significance of the generalizations that a (neo-)classical pragmatic approach enables us to capture.

REFERENCES

ARIEL, Mira (2003). Most: Lexical semantic and pragmatic aspects. Unpublished ms.

BACH, Kent (1994). Conversational impliciture. Mind & Language 9: 124-162.

BACH, Kent (2001). You Don't Say? Synthese 127: 11-31.

CARSTON, Robyn. (2002). Thought and Utterances: The Pragmatics of Explicit Communication. Oxford: Blackwell.

CHIERCHIA, Gennaro (2001). Scalar implicatures, polarity phenomena, and the syntax/pragmatics interface. Unpublished ms., U. of Milan. CHIERCHIA, Gennaro, Stephen CRAIN, Maria Teresa GUASTI, Andrea GUALMINI and Luisa MERONI (2001). The acquisition of disjunction: Evidence for a grammatical view of scalar

implicatures. BUCLD 25 Proceedings, 157-68. Somerville, MA: Cascadilla Press. CRAIN, Stephen & Paul PIETROSKI (2002). Why language acquisition is a snap. The Linguistic Review 19: 163-83.

GEURTS, Bart (1998). Scalars. In P. Ludewig & B. Geurts (eds.), Lexikalische Semantik aus kognitiver Sicht, 95-117. Tübingen: Gunter Narr.

HORN, Laurence (1992). The said and the unsaid. SALT II: Proceedings of the second conference on semantics and linguistic theory, 163-92. Columbus: Ohio State University Department of Linguistics. LEVINSON, Stephen C. (2000). Presumptive Meanings: The Theory of Generalized Conversational Implicature. Cambridge: MIT Press.

# Futurity in Default Semantics

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Abstract for the International Workshop "Where Semantics Meets Pragmatics"
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## 1. The modality of *will* and the modality of the 'future': An overview

This paper contributes to the ongoing debate concerning the status of the English *will* as a marker of (i) tense, (ii) modality, or (iii) ambiguous between the two (see e.g. Fleischman 1982; Enç 1996; Werth 1997; Hornstein 1990; Ludlow 1999). In particular, I concentrate on clearly modal uses of *will* as in (1) and (2) (epistemic and dispositional necessity respectively), as opposed to (3) where *will* is primarily a marker of future tense reference:

(1) Mary will be in the opera now.
(2) Mary will sometimes go to the opera in her tracksuit.
(3) Mary will go to the opera tomorrow night.

I demonstrate that when we adopt an approach to temporality based on event semantics (e.g. Parsons 1990; Kamp and Reyle 1993; Pratt and Francez 2001), the classification of *will* as modal turns out to be the most satisfactory solution. For this purpose I combine the analysis in Discourse Representation Theory (henceforth: DRT, Kamp and Reyle 1993) with my theory of default interpretations (Jaszczolt 1999a, b; 2002a, forthcoming) and use the properties of (i) the intentionality of mental states and (ii) its pragmatic equivalent of communicative, informative and referential intentions in communication in order to show that the degrees of intentions involved result in different interpretations of *will*. The strongest referential intention directed at the eventuality (state, event or process) results in the strongest commitment to the communicated eventuality and by the same token to the 'weakest degree of modality'.

The discussion of the properties of *will* is supplemented with a discussion of the semantic category of futurity. Sentence (3) is juxtaposed with expressions of futurity that use futurative progressive and tenseless future as in (4) and (5) respectively:

(4) Mary is going to the opera tomorrow night.
(5) Mary goes to the opera tomorrow night.

It is demonstrated that since the three readings differ as to the degree of modality, they can be given one overarching semantic representation. Since future *will* is best accounted for with reference to possible worlds (see e.g. Parsons 2002, 2003), it is not qualitatively different from modal *will*. Independently of using world-time units, the purely future *will* in (3) turns out as modal since it exhibits affinities with (1) and (2) on one hand, and (4) and (5) on the other, that are best explained by a scale of epistemic modality. The gradation of intentions strongly suggests that *will* is modal. Instead of the ambiguity/temporality/modality trilemma, there is a gradation of the strength of intending the eventuality that results in various degrees of modal meaning communicated by *will*.

I corroborate this argument by placing *will* in the framework proposed in Grice (2001). According to Grice's Equivocality Thesis, alethic and deontic modalities are univocal, derived from one conceptual core of *acceptability*. I propose that Grice's acceptability can be introduced as a modal operator (ACC) to Discourse Representation Theory, replacing the current unsatisfactory treatment of *will* that relies on a linear structure of the future and on representing firstly tenses and only derivatively temporality.

## 2. Futurity in Default Semantics

The main claim of Default Semantics is that utterances come with default interpretations. The dominant view in recent semantics and pragmatics is that in order to explain multiple readings of, let us say, propositional attitude sentences, sentences with sentential conjunction *and*, or negation, we have to postulate that semantic representation is underspecified as to some aspects of meaning, and further pragmatic processes in the form of (i) the developments of the logical form or explicature (Relevance theory) or (ii) implicatures (neo-Griceans) produce one exact reading. In contrast to this view, the theory of Default Semantics contains only one level of representation, derived from the structure and

properties of mental states. The general picture is this. People have various mental states, such as believing, doubting, fearing, knowing. Some of these states, like for example the ones just enumerated, necessarily have an object. In other words, they are intentional. Intentionality means directness, being 'about' an object – be it real object, mental object, or an ontologically unspecified eventuality, depending on the particular view or a particular mental state. Now, language is one of the vehicles of mental states (and the most important one). The properties pertaining to thoughts, beliefs, etc. will then also hold of linguistic expressions associated with them. On the level of linguistic expressions, this property of intentionality is realised as a property of an utterance's coming with intentions. In particular, the speaker is assumed by the addressee to intend to communicate a message through this utterance, and derivatively to inform about something and to refer to an object or eventuality.

Intentionality can be stronger or weaker. For example, reports on people's beliefs or other propositional attitudes can be *de re*, about a particular, known individual and come with strong intentionality, or they can be *de dicto*, about the proposition as a whole, whoever its subject might be. In the latter case intentionality is weaker. Just as intentionality allows for degrees, so do their realizations in the forms of intentions in communication. I have discussed and supported this view by various examples elsewhere (e.g. Jaszczolt 1997; 1999a, b; 2000; 2002a, b; forthcoming) and will now refer to this statement as to an established principle called the principle of Degrees of Intentions (DI):

DI: Intentions come in various sizes, i.e. they allow for degrees.

Let us see how this theory applies to expressions of temporality. In the case of the English *will*, we have three possible standpoints as far as its meaning is concerned: (i) it expresses future tense (and tense is not subsumed under modality; (ii) it expresses modality; and (iii) it is ambiguous between tense and modal senses. The ambiguity position is easily rejected by Grice's (1978) methodological principle called Modified Occam's Razor: *Senses (linguistic meanings) are not to be multiplied beyond necessity*. Communicating modality by means of *will* can be intended very strongly, less strongly, or to various other degrees. If we accept this gradation of intentions, then Default Semantics renders this choice between (i) and (ii) unnecessary. Instead, various degrees of intentions correspond to various interpretations and neither ambiguity nor underspecification ensues.

In order to develop this approach, we need two more principles of Default Semantics: the Parsimony of Levels and the Primary Intention. In addition to degrees of intentions, Default Semantics adheres to a principle of parsimony with respect to the number of proposed levels of meaning. The original semantic representation (logical form) is the output of the compositional process of meaning construction and combines information coming from sentence structure and individual concepts. This representation is frequently in need of further enrichment before it can count as a faithful representation of the intended meaning. However, this does not yet mean that there is any need in our theory for such a level of underspecified representation. As we know from DI, utterances come with different strengths of intentions. This degree of intending is correlated with the strength of intentionality of the corresponding mental state. The information from this degree of intentionality merges with the information from compositionality (i.e. with the logical form) and produces a complete propositional representation. This economy of levels of meaning is summarised in the principle of the Parsimony of Levels:

POL: Levels of senses are not to be multiplied beyond necessity.

So, instead of adopting the underspecified semantic representation and the fully developed prepositional representation, we have a more economical alternative of one meaningful representation to which the properties of the linguistic expression and the properties of the underlying mental state contribute, as it were, on equal footing. Meaning is compositional, but more fundamentally, it is also a result of having a thought, a meaningful mental state. The only way to represent this seems to be to recognize the level of meaning to which both compositionality and intentionality contribute. This level is the propositional representation and it is the only level we need in the theory.

The strongest intentionality means the strongest commitment to the proposition and hence the 'weakest modality'. A mental state is 'strongly about' some objects or situations and it is only through some context-dependent dispersal of this intentionality that the intentionality can become weakened. Since the strongest intentionality means the strongest aboutness, the corresponding readings of utterances are the ones, which secure the referent of the speaker's utterance, be it an individual or a situation. This is summarised in the Primary Intention principle:

Primary Intention (PI): The primary role of intention in communication is to secure the referent

(individual object or individual eventuality) of the speaker's utterance.

**3. Modal default and the ACC operator**

Grice (2001: 90) proposed that modals are 'univocal across the practical/alethic divide'. He called this theory an Equivocality Thesis. In the formal argument he introduced a rationality operator 'Acc' meaning 'it is (rationally) acceptable that'. If this is the case, then it is at least plausible that *will*, being a species of modality for the reasons to do with avoiding unnecessary ambiguity or underspecification, can be subsumed under the same category of acceptability. Namely, there is epistemic *will*, derived from the concept 'it is acceptable that', followed by the specification of time. This will account for the modal status of *will* and allow for its differing time reference. Acceptability, meaning 'it is reasonable to think that', 'it is rationally plausible that', allows for degrees. An event can be more, or less, acceptable due to being more, or less, certain, allowing for more, or less, commitment on the part of the speaker. For example, dispositional necessity in (2) comes with stronger acceptability than epistemic necessity in (1), which in turn comes with stronger acceptability than the regular future *will* in (3). In (3), the reading is 'it is to be expected that she will go', 'she will probably go'.

In (3), it is not only the future time reference that we have to represent but also the degree of acceptability. First, we have to distinguish degrees of commitment to the proposition. In other words, we need degrees of modality. We can use here a device well known from hidden-indexical theory where the *type of mode of presentation* accounts for the differences between different readings of, say, propositional attitude reports (see Schiffer 1977, 1992, 1996). On Schiffer's (1992) account, sentence (6) has the logical form as in (7):

(6) Ralph believes that Fido is a dog.
(7) _m(_*m & Bel(Ralph, <Fido, doghood>, m))

where _* is 'an implicitly referred to and contextually determined type of mode of presentation' (Schiffer 1992: 503).

We could use this principle of the type of *m* (_**m*) for futurity. Sentences (3)-(5) will now be represented by a partial DRS in *Fig. 1:

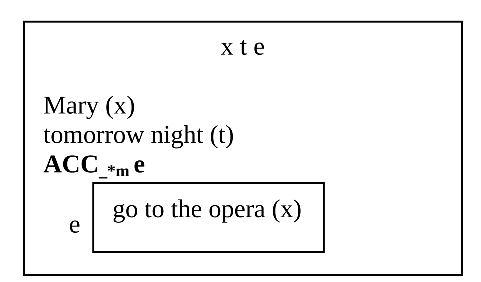



*Fig. 1

Fig. 1 will not suffice, though. Schiffer's _*m suffers from overdetermination, it provides more information than is necessary for getting the truth conditions right. I proposed instead the degrees to which *m* has to be specified. In other words, *m* can be coarsely-grained or finely-grained and we have to allow the varying degrees of detail through varying _*. I introduce $_^{n}$m for the degree *n* of fineness of detail of m, ranging from 0 (no relevance of m) to 1. The partial DRSs for (3)-(5) will now look as in Fig. 2, with the $_^{n}$ varying from, let us say, $_^{tf}$ for the tenseless future form in (5), through $_^{fp}$ for the futurative progressive in (4), to $_^{rf}$ for the regular future in (3):

x t e
Mary (x)
tomorrow night (t)
**ACC$_^{n}$m e**

e | go to the opera (x)

Fig. 2

These three indices correspond to three degrees of modality, derived from the three degrees of informative intention and at the same time three degrees of intentionality of the corresponding mental state, as summarized in the DI principle. In _$^{tf}$, reference is made to the future event without expressing any degree of detachment from the proposition expressed. Hence, this is the case of the strongest intentionality. In _$^{fp}$, the degree of commitment of the speaker to the proposition expressed is lower and hence a higher degree of modality is involved. Modality is in an inversely proportional relation to the degree of commitment or assertability, possibility, evidence, etc. It is also in an inversely proportional relation to the degree of intentionality of the corresponding mental state as well as to the degree of the communicative intention with which the proposition was uttered. In _$^{rf}$, we have the highest degree of modality and the lowest degree of commitment.

In this proposal, I have departed from the DR-theoretic practice, on Kamp and Reyle's (1993) version, of representing *tenses*. Instead, I focussed on the dependencies between tenseless future, futurative progressive and regular future tense in relegating the differences to _$^{n}$m. This move was dictated by the earlier proposal that temporality, at least with respect to the future, if not generally, is more adequately described as modality, degree of commitment, or ACC. I have combined (i) an investigation of *futurity* as a semantic category with (ii) an investigation of the auxiliary *will*. The first resulted in the representation in Fig. 2, with *n* of _$^{n}$m varying between tf, fp and rf. These values represent some, as yet unspecified, points on the scale of n ranging from 1 to 0 as in Fig. 3:

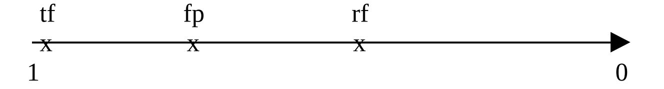



Fig. 3

The placement of the values on the scale is arbitrary as it has not been determined. While we know the relative positions of *tf*, *fp* and *rf* from the properties of use of these forms, their absolute placement on the scale will require a detailed empirical study.

Problem in (ii) concerns examples (1)-(3). (3) is well accounted for by ACC and _$^{n}$m as in Fig. 2. As far as (1) and (2) are concerned, we can now account for them by a relative comparison of the strength of ACC in (1) and (2) with that of the regular future in example (3). Firstly, from _$^{n}$m and Fig. 3, we adopt the position that temporal markers have their unmarked, default interpretations. Just as 'will go' by default expresses simple future and the strongest modality out of (1)-(3), so 'goes' by default expresses simple present and 'is going' continuous present. Kamp and Reyle's analysis works well for these default meanings. Where it becomes inadequate is the departures from these defaults such as tenseless future of (5), futurative progressive in (4), and also *will* of epistemic and dispositional necessity as in (1) and (2) respectively. As was presented above, the default sense of *will* is accounted for by ACC and _$^{rf}$m. Now, just as the epistemic necessity *will* and dispositional necessity *will* are not the default uses of *will*, so tenseless future is not the default use of the form 'goes' nor futurative progressive a default use of 'is going'. Each of these expressions can be used with its default sense or with a sense that departs from this default. This departure corresponds to different strength of ACC, explained by different degrees of intentionality and relevant intentions as in the DI principle. In short, scales of intentionality are useful in two ways. Firstly, we can represent that future time reference is scalar, as in Fig. 3 for (3)-(5), adding other forms such as epistemic *may*, epistemic *can, might, could* with future-time reference towards the 0 end of the scale. But secondly, and more importantly, we can present the interrelations between different uses of a particular linguistic form such as 'will', 'goes' or 'is going'. Just as future time reference has its default expression in (3) rather than (4) or (5), so every such expression belongs to its own scale of defaults and departures from defaults. In this way, the sense of *will* in (3) is the default among (1)-(3), with the weakest intentionality and the strongest modality.

Regular future *will* acquires the DRS with the ACC operator and the mode of presentation m of the degree _$^{rf}$m. *Will* of epistemic necessity in (1) can now be presented as overriding ACC _$^{rf}$m by the condition 'now (t)'. Even if the temporal adverb 'now' were not overtly present in the sentence, it would have to be recovered from the context. DRSs have means of accounting for this type of conversational inference. If 'now (t)' were not communicated, *will* would remain of the default, ACC _$^{rf}$m type.

In order to distinguish epistemic *will* from epistemic *must* etc, we specify in the DRS the route to ACC. We will represent it as $ACC\ _^{rf}m\ _{}_{c}ACC$. The symbol ‘$_{}_{c}$’ stands for ‘contextually results in’. The partial DRS for sentence (1), repeated below, is now as in Fig. 4:

x t s

Mary (x)
now (t)
**$ACC_^{rf}{}_{m}\ _{}_{c}ACC$**
ACC s

s | be in the opera (x)

Fig. 4

The dispositional necessity *will* of (2) acquires an analogous representation. The route for ACC is $ACC_^{rf}{}_{m}\ _{}_{c}ACC$ and the difference between epistemic and dispositional necessity is guaranteed by the information contained in the adverb – either overtly expressed or recovered from the context. The partial DRS for (2) is as in Fig. 5:

x t e

Mary (x)
sometimes (t)
**$ACC_^{rf}{}_{m}\ _{}_{c}ACC$**
ACC e

e | go to the opera in x’s tracksuit (x)

Fig. 5

The difference between ‘will’ and, say, ‘would’ is maintained by retaining the route $ACC_^{rf}{}_{m}\ _{}_{c}ACC$ in the DRS.

**4. Concluding remarks**

Degrees of modality represented as different values of $ACC_{_m}$ account for the senses of *will* in (1)-(5). These degrees have been founded on the POL, DI and PI principles and on Grice’s notion of acceptability that I translated into the DR-theoretic operator $ACC_{_m}$. By introducing ACC to DRT, we can replace the listing of DRSs associated with different interpretations of *will* by correlated DRSs founded on the default representation as for sentence (3) and departures from this default as in (1)-(2). At the same time, we can establish interrelations between different expressions of temporality by means of adding values of ACC to the relevant DRSs as has been done above for (3)-(5).

*Select references*


Enç, M. 1996. ‘Tense and modality’. In S. Lappin, ed. *The Handbook of Contemporary Semantic Theory*. Oxford: Blackwell.345-358.

Grice, P. 2001. *Aspects of Reason*. Ed. by R. Warner. Oxford: Clarendon Press. London: Routledge and Kegan Paul.

Jaszczolt, K.M. 1999. *Discourse, Beliefs, and Intentions: Semantic Defaults and Propositional Attitude Ascription*. Oxford: Elsevier Science.

Jaszczolt, K.M. forthcoming. ‘Prolegomena to Default Semantics’. In *Perspectives into the 21st Century*. Selected Papers from the International Linguistics Conference, Athens, 2002.

Jaszczolt. K.M. in progress. *Default Semantics*. Oxford: OUP.

Kamp, H. and U. Reyle. 1993. *From Discourse to Logic: Introduction to Modeltheoretic Semantics of Natural Language, Formal Logic and Discourse Representation Theory*. Dordrecht: Kluwer.

Ludlow, P. 1999. *Semantics, Tense, and Time: An Essay in the Metaphysics of Natural Language*.

Cambridge, Mass.: MIT Press.
McTaggart, J.E. 1908. 'The unreality of time'. *Mind* 17. Reprinted in J.E. McTaggart, 1934, *Philosophical Studies*, London: E. Arnold, pp. 110-131.
Parsons, J. 2002. 'A-theory for B-theorists'. *The Philosophical Quarterly* 52. 1-20.
Parsons, J. 2003. 'A-theory for tense logicians'. *Analysis* 63: 4-6.

**How Alternative Question and Conjunctive Question Generate Contrastive Focus and Contrastive Topic, respectively**

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This paper proposes a reasonable distinction between Contrastive Focus (CF) and Contrastive Topic (CT), based on a dialogue/discourse model of question and answer. It basically argues that CF follows (/accommodates) an alternative disjunctive question, whereas CT responds to a conjunct of a previous/accommodated conjunctive question with a potential Topic (Lee 1999). This explains why CF is exhaustive and why CT conveys a negative (higher) predicate meaning. This distinction will help remove much confusion about the categories CF and CT in the field of information structure (e.g. Choi 1999 and many others) and help understand how far semantics works and from what point pragmatics intervenes. Recently much has been done on CT in English (Steedman 2000), in German (Buring 2000) and in Korean (1999) but the nature of CF has not been well explored and the two categories have not been clearly characterized in a question and answer dialogue model, although Carlson (1983) and Roberts (1996) touch on the model with respect to CT. This paper will use Korean and English data for arguments, but will utilize some other languages whenever necessary.

If some matters of concern are poised as disjunctive, e.g., as in an alternative disjunctive question (ADQ), and the speaker responds with a disjunct of the Q, making a choice, then it becomes a CF. Consider the (accommodated) question (1) and a reply (2) or (2 ):

(1) Did the baby pick the money first/H% or the pen first\L%?:
(2) She picked the MONEY$_{CF}$ first.
(ACC required, not a CT marker in Korean/Japanese)
(2 ) (aki-ka) TON$_{CF}$-ul/?*ton-un mence cip-ess-e. (Korean)
baby-NOM money-ACC/money-CT first pick-PAST-DEC
The baby picked the money first(?*$_{CT}$).

Because of the alternative question intonation /H% \L%? in (1), the speaker presupposes not both and the choice item in reply (2) is exhaustive. The other alternative is excluded. Therefore, if the reply is given in a context corresponding to And she also picked the pen first, then the reply sentence turns out to be false. In (2 ), we can see the object taking the ACC marker, not the CT marker. Case-marking is compatible with focus no matter whether it is informational or contrastive.

Extending Schwarzschild s.(1999) F-marking for not given, we mobilize CF-marking as follows:

(3) {Mary s old convertible is no longer available. What is Sam going to do?}
A: He ll [**rent**H*$_{F}$ her **new**H*$_{CF}$ convertible]$_{F}$
(4) Is he going to do something about the **old**H* convertible or do something about the **new**H* convertible?

From (3) we can come up with an alternative question (4) between the alternative elements ***old*** and ***new***. Then, we can CF-mark ***new*** in answer (3A). CF is likewise derived from linguistic contexts as well as situational contexts such as the following:

(5) **Nay**$_{CF}$-ka nayl-kkey
I-NOM pay-will
**I**$_{CF}$ will pay.
(6) Will **you**$_{CF}$ pay, or shall **I**$_{CF}$ pay?

In (5) the competition shown in (6) occurs, with a pair of alternatives. It is obvious from the context. Note that the CF-marked subject in (5) is NOM-case-marked, never TOP-marked. This is also true of Japanese (with —*ga*). It can be said to be exclusive or exhaustive.

But if -*man* only is attached to make ***na***—*mani*- I-only-NOM in (5), it becomes inappropriate. (5) is exclusive but the expression with the exhaustive operator —*man* only entails a negative P about the alternatives not taken (here the hearer), i.e.,

(7) If C (set of comparable alternative members) = {a, b, c} and P( x _ C), then
´P((y _ C) › a)) (the exhaustiveness effect of only a )

Note that only functions as a negative polarity item licensor in English and Korean. Negative force with only is unmistakable, whereas positive force with CF alone is evident. For CF there is open rivalry among the alternatives and one single element is chosen in a positive identificational manner. Other alternatives are poised to have equal chances for being chosen and that seems to be why Horn (1981) and Vallduvi (1992) are reluctant to take an interpretive position for CF and attribute the exhaustiveness feeling from CF to a conversational implicature. Brunetti (2003) also denies a semantic interpretive effect or prosodic distinction in Italian CF.

A yes/no (=verum) question is also a case of alternative question semantically and generates CF. The question *Did Sam leave*? is equivalent to the alternative question *Did Sam leave or* (*did he*) *not* (*leave*)? and generates *Yes, he* ***did***$_{CF}$ or *No, he* ***didn t***$_{CF}$. An answer such as *He did and didn t* is not appropriate.

Correctives are also instances of CF. Consider the corrective responses:

(8) A: Sam borrowed the book that Max had purchased.
a. No, **Mary**$_{CF}$ borrowed it. <- Did Sam/H% or Max\L% borrow it?
b. No, Max **borrowed**$_{CF}$ it. <-Did Sam **purchase**/H% or **borrow**\L% the book?

There are cases of more complex Reciprocally Contrastive Focus, as in (9), which is generated by an alternative disjunctive question like (10):

(9) I told you: **Sam** $_{CF}$ sued the **compan**$_{CF}$ .
(10) ADQ: Did Sam sue the company or did the company sue Sam?

In (10) we can notice the reciprocal relation between the subject and the object. Then, the subject and the object in (9) are CF-marked reciprocally.

Locally viewed, CF may look non-distinct from information focus. For instance, (9), without CF-marking, may be generated by the question: *Who sued whom*? But globally viewed, (9) itself is generated by (10), the alternative question, not by an information *wh*-question. In this case, CF and information focus may not have interpretive differences, although there is a sharp distinction in contextually determined information structure. The distinction gives rise to CF-fronting in various languages (English, German, Italian and Korean) (including negative inversion) with no intonational break because CF is IP/VP-internal, unlike CT.

Now let us turn to Contrastive Topic (CT), which I argue is generated by a previous or accommodated conjunctive question. Consider:

(11) What about Frank? Did he eat the beans and (did he eat) the peanuts?
(12) He ate the **beans**L+H*LH%.
(13) khong-UN/?*-ul mek-ess-e
beans —CT /?*ACC eat-PST-DEC
(He) ate the beans$_{CT}$ .

CT typically responds to one conjunct and conveys a contrasted polarity-reversed proposition, as in (12) and (13). The referents of one common noun can be divided into parts to form a conjunction (e.g., *money* coins and bills, *parents* mother and father, *the kids* Mia and Ken ). Predicates also take CT crosslinguistically (as in *o-ki-NUN hae-ss-e* or *ki-WA shit-ta* (She) CAME$_{CT}$. [L+H*LH%] => but - didn t work =denial of a higher predicate on scale; common nouns also often forms a scale, e.g., <bills, coins>; (14) *I have COINS$_{CT}$=>* but I don t have bills. The answer given in (14) cannot appropriately be followed by an additive I also have bills (?*--- *kuriko cicen-to iss-e* in Korean) which makes the discourse contradictory. Epistemic hedges such as maybe must intervene to save the connection, contra Buring s (2000) and Rooth s (1996) claim that the conveyed meaning is a conversational implicature. The unrealized conveyed meanings are conventional and may be more than implicatures, in line with argumentation logic (Krabbe 2000), according to which the conveyed proposition is more assertive than the realized concessive admission part of the utterance, and also in line with multi-propositional theory claims by Bach (1998) and Neale (2000), which claim that conventionally conveyed propositions must be true to make the entire given utterance true.

An utterance of a predicate in CT generates a polarity-reversed predicate meaning inversely (Lee 2003):

(15) If CT(p) is given, then contrastively ( but ) not q (q: a higher stronger predicate) is conveyed and if CT(not-q) is given, then contrastively p (a lower weaker predicate) is conveyed.

Buring s (2000) D-trees must be conjunctive and sensitive to sister subquestion answers to get a proper CT reading for a branch subquestion answer with an appropriate polarity-reversed conveyed proposition. Otherwise, the answers are simply list CTs with no conveyed meaning left. Buring does not make distinctions clear. .

Steedman (2000) misleadingly labels CT with its contrastive contour as "Theme" and gives a structurally unjustified Combinatory CG analysis as if it were a Topic in a

single S but L+H* compositionally signals a complex S, expecting a conveyed/expressed (in a list CT) proposition.
In CT, the current speaker initially deviates by responding to a part or conjunct from the previous speaker's presupposition regarding the potential total (conjunctive) topic, unlike in CF. In CF the current speaker accepts the previous speaker's presupposition regarding the alternative question/choice, coping with her expectation of answering the question with one disjunct. There occurs exclusion of other alternatives and we view the choice as exhaustive. CF is still a narrow focus and takes a case marker and/or a focus stress. The Focus value is a set of propositions, whereas the CT value is a more complex set of sets of propositions (Buring 2000). The speech act question is not Boolean (Krifka 2001) in the sense that it is conjoined but not usually disjoined, which is derived from the fact that all speech acts are positive and not negative or uncertain (see Lee 1973). An answer to a disjunctive question is subsumed under choice readings (Groenendijk & Stokhof 1984).

An alternative question in Korean consists of two or more full question sentences because of word order and intonation, superficially unlike in English, where ellipsis occurs (disjunction takes wide scope over question anyway). This is distinct from a disjoined NP under the scope of a question, which forms a normal yes/no question.

There are cases in which a positive *wh*-question (of blaming) is answered by a negative CT utterance. The speaker of the *wh*-question in (17) below does not expect (18), a CT-marked utterance, as a direct reply.

(16) nu-ka col-ass -ni?
who-NOM doze.off-PAST Q Who dozed off ?

(17) ce-**nun** an col-ass-eyo
I- CT not doze.off-PAST **I**$_{CT}$ didn t doze off.

(18) a. Someone dozed off.
b. Did you doze off?
c. Did you and your friends doze off? (the answerer s presupposition)

(17) serves as an answer to (16) through the process of accommodation. (18a&b) are implied by (16). The underlying question is assumed to be something like (18c). A non-blaming question can be answered by a positive CT sentence.

The boundary between CF and (information) focus is not as clear as the distinction between (non-contrastive) topic and CT. CF, generated by D-linked *which* interrogatives or alternative question, requires a closed set of disjunctive alternatives determined by the discourse, causing exhaustiveness semantic interpretive effects, whereas focus requires a looser set of alternatives. Contrastive Focus is a focus, as its head noun indicates. Naturally, it is case-marked in Korean and Japanese just like an information focus, whereas CT is *-nun*-marked just like a non-contrastive topic.

The idea of alternative disjunctive questions proposed here as a testing device for CF, however, clearly distinguishes it from CT, although CT and CF do have a notion of *contrast* in common with a contextually closed set of alternatives. The distinction also demonstrates that we need scale semantics incorporated into the phenomenon of Contrastive (Predicate) Topic.

**REFERENCES** (selected)

Bach, K. 1999. "The myth of conventional implicature." *Linguistics and Philosophy* 22/4:327-366.
Buring, D. 2000. "On D-trees, beans and B-accents." Ms. UCLA.
Choi, Hye-won. 1999. *Optimizing Struture in Context*: *Scrambling and Information Structure*. CSLI.
Groenendijk, Jeroen & Martin Stokhof. 1984. *Studies on the Semantics of Questions and the Pragmatics of Answers*. Doctoral Dissertation, University of Amsterdam.
Han, Chungye. 2001. Ellipsis in the Syntax of Alternative Questions, *NELS* 32.
Krabbe, E.C.W. 1999. "The problem of retraction in critical discussion." Paper at Ontario Soc for the Study of Argumentation. Ms.
Krifka, M 2001. Quantifying into Question Acts, *Natural Language Semantics*----.
Lee, Chungmin. 1999. "Contrastive topic: A locus of the interface." In *The Semantics/Pragmatics Interface from Different Points of View 1,* K. Turner (ed), 317-41. London: Elsevier.
Neale, S. 1999. "Coloring and composition." *Philosophy and Linguistics* ed. by K. Murasugi and R. Stainton. Westview Press.
Rooth, M. 1996. "Focus." *The Handbook of Contemporary Semantic Theory*, S. Lappin (ed). Blackwell.
Steedman, M. 2000. Syntactic Process. MIT Press.

# The Hidden Path of Semantic Content within Pragmatic Context: The definite article, "*the*"

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This study argues that semantic traits can determine the likelihood of a noun occurring in a definite construction in discourse. The research presents a set of corpus analysis and web-search data, illustrating that some noun phrases being "definite" in discourse is not just the result of the pragmatic contexts involved, but also that of their semantic contents.

Many researchers who have studied the definite construction of "*the*" in English have followed a pragmatic, and perhaps anaphorically-orientated approach, emphasizing that the use of the construction is primarily "discourse-driven" and predominantly "anaphoric" in nature. Some approach radiating from this perspective include: the notions of "identifiability", "familiarity" and "giveness" (e.g., Gundel et al 1993, 1996, 2001; Chafe 1976; Prince 1981, 1992); the mechanism of "bridging inferences" (e.g., Haviland and Clark 1974, Clark 1978); the theory of "common ground" (e.g., Clark 1992); the hypothesis of "relevance" (e.g., Matzui, 2000; Sperber and Wilson 1995), and the effect of "accessibility" (e.g., Ariel 1988).

Although some studies point out that certain semantic relationships, e.g., the part-whole relationship, may be used by the hearer to identify definite referents (e.g., Hawkins 1978; Erku and Gundel 1987, Prince 1981), the process has been discussed primarily as a general pragmatic mechanism, rather than one that could be lexically specific to the words being used.

A handful of researchers, however, have introduced a stronger semantic perspective to the issue. Lobner 1985 argues that some nouns are "definite" simply because they are semantically so. He proposes that many definites in discourse are indeed “Semantic Definites”. Semantic Definites establish their referents independently from the immediate situation or context of the utterance, but refer to their referent with a semantic property of their own. Fraurud 1996 expresses a similar view. She studied her Finnish corpus the correlation between definite encoding and the ontological classes of the definite referents. She found that definite noun phrases that denote non-human entities are more likely to be “antecedent-less” in discourse, when compared to those denoting human entities. Moreover, many of the antecedent-ness definites (i.e., First Mention Definites) are actually semantic "functionals" - to be identified indirectly through their

semantic arguments (e.g., *the nose, but *a nose*).

In this investigation, I extend this second view of Semantic Definiteness on several counts.

The study begins with new evidence to confirm that non-anaphoric definites are prevailingly common in natural discourse. It presents an analysis of 1417 definite noun phrases in a database, that contains two interview transcriptions and twenty articles of various genres: stories, reviews, columns, news. It shows that similar to what Fraurud has found in the Finnish corpus, approximately half of the definite noun phrases of "*the*" in the English corpus are non-anaphoric, First Mention Definites (i.e., do not have an explicit previous mention in the discourse) - 414 NPs out of a total of 876 in the written corpus and 262 NPs out of a total of 541 NPs in the interview transcriptions (excluding possessive expressions, relative clauses, and prepositional phrases). This result adds to the limited but growing amount of corpus evidence provided by other researchers (Fraurud 1996, Gundel 2001, Poesio and Vieira 1998), who recently have also shown that non-anaphoric definites are in fact common in natural contexts; and more research is needed to explore the contents of these definite noun phrases.

Next, the study presents data to support the idea that semantic properties of certain noun phrases, rather than the pragmatic contexts, play a role in speakers' choice of their definite encoding in discourse. I propose that there are two components to this phenomenon of "semantic definiteness": the Modifier-Driven Definites and Head-Noun-Driven Definites.

First, some antecedent-ness definite noun phrases are definite, because they consist of modifiers of certain properties. My analysis shows that about thirty percent of the antecedent-less definites in the corpus contain modifiers favoring the use of a definite article with the noun phrase, regardless of the discourse contexts. These modifiers include those that are typically use to express quantities (e.g. *a few of, the rest of*), relative positions (e.g., *the other, the middle of, early*), ordinal concepts (e.g., *first, second*), and the status of familiarity (e.g., *famous, well-known*). They also include some adjectives that are "contrastive" in their semantic content (e.g., *big, small, only*).

Second, I found about sixty five percent of the antecedent-less definites consist of head nouns that have specific semantics to them. They denote generic concepts (e.g., *the sun*; 18%), functional concepts (e.g., *the doors*; 29%), or proper names (e.g., *the U.S. Appeal Court*; 18%). This set of findings is consistent with the corpus patterns presented in recent studies by other researchers (Fraurud 1996; Poesio and Vieira 1998). They show that the semantic properties of the head noun can also contribute to its definiteness.

The study further provides direct evidence to demonstrate that some lexical items are indeed more likely to be definite when compared to others, due to the specific traits of

their semantic contents. A sample of 150 nouns was collected from the corpus to enter a "web-search procedure" with the Google search engine, to measure how many web pages on the Internet may contain the phrases, "*a* + N" vs. "*the* + N". If the semantic traits of a lexical item have little bearing on its being definite or not, all the items would have a frequency ratio of "*the*-N : *a*-N" to be within the baseline variation, i.e., the frequency ratio of *"the"* : "*a*" in natural discourse (from corpora and web-search measures, about 1:1 to 2.5:1). However, some extreme ratios were found. Initial analyses have shown that the more "semantically relational" a noun is, the more likely it would be modified by *the* in various contexts, i.e., to have a higher "*the*-N vs. *a*-N" ratio of frequency (some examples of these words are: *denominator* = 18:1, *bottom* = 13:1, *dough* = 8.5:1). On the other hand, nouns that seem to have a "low-information" content are least likely to be modified by "*the*", the measures show (e.g., *compliment* = 0.3:1, *gift* = 0.35:1, *foothold* = 0.04:1).

This research adds new evidence to support a semantic view of definiteness. It reveals three relevant phenomena. First, some nouns are likely to be definite regardless of the discourse context, because of their semantic properties of "intrinsic identifiability". Some items, on the other hands, are "unlikely" to be definite, perhaps because they are semantically "vague" in content. Finally, the semantics of the modifier in a noun phrase frequently play a role in determining the definiteness of the referent, regardless of its discourse status.

The role of semantic content in definiteness, as discussed in this study, is an illustration on how semantic contents can enter the realm of pragmatic mechanisms, to exercise their influence on a choice of a "seemingly" pragmatic construction - the definite encoding of nouns.

Cited References:


Ariel, Mira. 1988. Referring and accessibility. *Journal of Linguistics* 24: 65-87.

Chafe L Wallace. 1976. Giveness, Contrastiveness, Definiteness, Subjects and Topics. In *Subject and Topic*, Charles N. Li (Ed). Academic. New York.

Clark H. 1977. Bridging. In Johnson-Laird and Wason (eds) *Thinking: Readings in Cognitive Science*. John Wiley and Sons NY

Clark, H. 1992. *Arenas of Language use*. The University of Chicago Press.

Erku and Gundel 1987 The Pragmatics of Indirect Anaphors. In Jef Verschueren and Marcella Bertuccelli-Papi (eds) *The Pragmatic Perspective*: Selected Papers from the 1985 International Pragmatics Conference. John Benjamins. Amsterdam.

Fraurud, Kari. 1996. Cognitive Ontology and NP Form. In *Reference and Referent Accessibility*. Thorstein Fretheim and Jeunette K Gundel (Eds).

Gundel et al 2001. Definite Descriptions and Cognitive Status in English: Why Accommodation Is Unnecessary. *English-Language-and-Linguistics* 2001, 5, 2, Nov, 273-295.

Gundel K. Jeanette. 1996. Relevance Theory Meets the Givenness Hierarchy. In Fretheim, Thorstein, & Gundel, Jeanette K. [Eds], *Reference and Referent Accessibility*.

Gundel, Jeanette K; Nancy Hedberg, Ron Zacharski. 1993. Cognitive Status and the form of referring expressions in discourse.

Haviland,-Susan-E.; Clark,-Herbert-H.. 1974. What's new? Acquiring new information as a process in comprehension. *Journal-of-Verbal-Learning-and-Verbal-Behavior*;1974, 13, 5, Oct, 512-521..
Lobner 1985. Definites. *Journal-of-Semantics*; 1985, 4, 4, 279-326.
Matsui,-Tomoko. 1998. Pragmatic Criteria for Reference Assignment: A Relevance-Theoretic Account of the Acceptability of Bridging. *Pragmatics-and-Cognition*; 1998, 6, 1-2, 47-97.
Prince, Ellen F. 1981. Toward a Taxonomy of Given-New Information. in: P. Cole (ed.), *Radical Pragmatics*, Academic, New York
Prince, Ellen F.. 1992. The ZPG letter: Subjects, definiteness, and information status.. In: William Mann and Sandra Thompson, eds., *Discourse description: Diverse linguistic analyses of a fund-raising text*, 295-325.
Sperber, D. and D. Wilson. 1995. *Relevance: Communication and Cognition.* Oxford: Blackwell.

## Referential Expressions and Syntax-Semantics(-Pragmatics) Interface

The exact nature of referential possibilities of the so-called reflexive *jibun* (or *zibun*) has been a contentious issue throughout the history of Japanese linguistics. This is mainly because this expression has a wider referential than other languages such as English. The dialectal and idiolectal variation also accounts for the controversy.

There have been many attempts to capture the behaviour of *jibun* by syntactic constraints. One such example, which is relatively comprehensive, is proposed by Kameyama (1984: 228). She proposed that the antecedent for *jibun* (a) must be the subject of the sentence; (b) need not be in the same clause as *jibun*; (c) must 'command' *jibun*; and (d) must be animate. Such conditions alone cannot explain the following examples:

(1) Taroo-ga Jiroo-ni jibun-no-koto-wo hanas-ase-ta.
Taroo-NOM Jiroo-DAT jibun-GEN-COMP-ACC tell-PASS-PAST
"Taroo$_i$ had Jiroo$_j$ talk about self$_{i/j}$"

(2) Taroo-ga Jiroo-ni jibun-no-koto-wo hanasite-morat-ta.
Taroo-NOM Jiroo-DAT jibun-GEN-COMP-ACC tell-BENE-PAST
"Taroo$_i$ benefited from Jiroo$_j$ talking about self$_{i/j}$"

(3) Taroo-ga Jiroo-ni jibun-to-sokkurina-otoko-ga-iru-koto-wo
Taroo-NOM Jiroo-DAT jibun-COMP-resemble-man-NOM-exist-COMP-ACC

shiras-are-ta.
inform-PASS-PAST
"Taroo$_i$ was informed by Jiroo$_j$ of the fact that there is a man resembling self$_{i/j}$"

(4) Taroo-wa Jiroo-kara Saburoo-ga jibun-wo bengosuru-koto-wo
Taroo-NOM Jiroo-from Saburoo-NOM jibun-ACC defend-NOM-ACC

kiita.
heard

"Taroo$_i$ heard from Jiroo$_j$ that Saburoo$_k$ would defend self$_{i/j/k}$"

(5) Taroo-wa Jiroo-ni Saburoo-ga jibun-wo nikundeiru-koto-wo
Taroo-NOM Jiroo-DAT Saburoo-NOM jibun-ACC hate-NOM-ACC

kiita.
heard

"Taroo$_i$ heard from Jiroo$_j$ that Saburoo$_k$ hated self$_{i/j/k}$"

(6) Taroo-wa Jiroo-ni Saburoo-ga jibun-wo nikundeiru-koto-wo
Taroo-NOM Jiroo-DAT Saburoo-NOM jibun-ACC hate-NOM-ACC

hanashita.
told

"Taroo$_i$ told Jiroo$_j$ that Saburoo$_k$ hated self$_{i/*j/k}$"

(7) Jibun-ga gandearu-toiu-shindan-ga Taroo-wo
jibun-NOM has cancer-COMP-diagnosis-NOM Taroo-ACC

zetsuboo-ni-oiyatta.
despair-DAT-sent

“The diagnosis that self$_i$ has cancer despaired Taroo$_i$.

(1)-(3) may be explained by extending the condition (a): ‘the sentence’ can cover an embedded one as in the case of (1) and (2) or ‘the subject’ could be changed to ‘the agent’ as in (3). Others, however, do not seem to be accounted for by such modification. For instance, *Jiroo* in (4) and (5) is neither the subject nor the agent in any conceivable sense. In (6), on the other hand, the seemingly same *Jiroo* cannot act as the antecedent. Finally, in (7), there is no real antecedent, for *jibun* appears in the sentence-initial position.

To account for these examples, Kameyama (1984: 230-1) revises her conditions, employing the following features:

[+/- sb] whether or not the antecedent must be a grammatical subject
[+/- ncl] whether or not the antecedent must be in the same clause nucleus as the anaphor
[+/- log] whether or not the anaphor must lie in an indirect discourse structure with respect to the antecedent that designates the “logophoric” subject

Logophoric pronouns, as originally proposed by Hagege (1974), are those pronouns which refer to the author of a discourse or someone whose thoughts are reported. Clements (1975: 141) slightly extends this, stating that the antecedent of the logophoric pronoun must be “the individual (other than the speaker) whose speech, thoughts, feelings, or general state of consciousness are reported”.

Following Clements, Kameyama’s main proposal is that *jibun* has the disjunctive feature [+sb/+log]. In the version of Lexical Functional Grammar in which Kameyama’s account is given, the deep-structure subjects of transformational grammar correspond to XCOMP SUBJ, i.e. the subject of an open complement, which has the feature [+sb]. This means that noun phrases in the problematic examples will have the following features:

(4) Taroo [+sb]; Jiroo [+log]; Saburoo [+sb]
(5) Taroo [+sb]; Jiroo [+log]; Saburoo [+sb, +log]
(6) Taroo [+sb]; Jiroo OBJ2; Saburoo [+sb, +log]
(7) Taroo [+log]

The proposed feature can thus explain the fact that *Jiroo* cannot be the antecedent of *jibun* in (6). It should be noted here that by adding the feature [+ log], Kameyama’s account no longer remains purely syntactic.

So far so good. There are, however, examples that suggest it is not sufficient.

(8) Hanako-wa Masako-ni jibun-ga kimeta-jikan-ni
Hanako-TOP Masako-DAT jibun-NOM decided-time-at

kuukoo-ni mukaenikite-morat-ta.
airport-to come and meet-BENE-PAST

"Hanako$_i$ benefited from Masako$_j$'s coming to meet her at the time self$_{i/??j}$ had decided."

(9)

| Hanako-wa | Masako-ni | jibun-no-ie-de | gochisoo-wo |
|---|---|---|---|
| Hanako-TOP | Masako-DAT | jibun-GEN-house-LOC | feast-ACC |

youishite-morat-ta.
prepare-BENE-PAST

"Hanako$_i$ benefited from Masako$_j$'s preparing a feast at self$_{i/j}$'s house."

(10)

| Hanako-wa | Masako-ni | jibun-no-munenouchi-wo |
|---|---|---|
| Hanako-TOP | Masako-DAT | jibun-GEN-feelings-ACC |

kiite-morat-ta.
listen-BENE-PAST

"Hanako$_i$ benefited from Masako$_j$'s listening to how self$_{i/*j}$ felt."

(11)

| Hanako-wa | Masako-ni | jibun-no-ie-ni |
|---|---|---|
| Hanako-TOP | Masako-DAT | jibun-GEN-house-to |

kaette-morat-ta.
go back-BENE-PAST

"Hanako$_i$ benefited from Masako$_j$'s going back to self$_{i/??j}$'s house."

Kuno (1978; cf. Kuno and Kaburaki 1977) employs the notion of empathy in order to account for the referential behaviour of *jibun*. Under his framework, the examples (8)-(11) are speaker-oriented, i.e. the sententially-denoted event is reported from the viewpoint of the subject, *Hanako*. This is because all these sentences contain *morau* (literally "receive"), one of the numerous verbs of giving and receiving in Japanese, which functions like an auxiliary and implies that the referent of the subject benefited from the reported event. This works for (8) and (10) where there appears to be a strong preference for *jibun* to refer back to *Hanako*. However, *jibun* can either be *Hanako* or *Masako* in (9), and even worse, it would under normal circumstances refer to *Masak*o in (11). Kameyama's account, equipped with logophoricity, cannot explain these examples, either, as it would have to assign the feature [+sb] to *Hanako* in all examples. Moreover, as all of the examples report *Hanako*'s perspective, it would have to assign the feature [+log] or something similar as well. It should follow that *Hanako* would have to be the antecedent of *jibun* in (8)-(11), a counter-intuitive conclusion.

The problem arises because the referent of *jibun* needs to take into account contextual plausibility, on top of its preference for the referent of the subject expression and the logophoric entity. That is, the main reason why *jibun* should refer to *Hanak*o in (8) and (10) is because that interpretation is contextually plausible. It is more convenient for *Hanako* if she can decide the time *Masako* comes to pick her up in (8), and *Hanako* can feel better by having had *Masako* listening to her feeling. (Also, it would be rather strange for *Hanako* to tell *Masako* how *Masako* feels.) Similarly, *Masako* can be *jibun*'s strongly-preferred antecedent in (11) is because of contextual plausibility: *kaeru* "go back" is agent-oriented and it would be natural to assume *Masako* went back to her own house. And *jibun* in (9) can refer to either because *Hanako* could be a beneficiary wherever cooking is done.

For the benefit of non-native speakers of Japanese, it should perhaps be pointed out at this point that *jibun* can in some cases refer to the speaker (or the author) of the entire sentence: here it applies to the case of (8) (and possibly also to (9). This may be accounted for if the notion of logophoricity is somehow extended but it is difficult to conceive how; and it still remains essential to explicate contextual plausibility, for *jibun* does not always refer to the speaker/author.

This shows that the referential range of *jibun* cannot be accounted for simply by syntactic constraints and that adding some semantic/pragmatic factors to a basically syntactic explanation is insufficient. Approximately twenty years have passed since Kameyama and Kuno made their proposals, and yet no recent syntactic accounts contain any more plausible arguments. What is required is some mechanism that can represent "context" properly and can explain how plausibility is computed.

For this purpose, attempts by Artificial Intelligence researchers to formalise the notion of context appear useful. The most widely used framework is the one proposed by John McCarthy (e.g. McCarthy 1983 & 1996; McCarthy and Buvac 1997). This work, however, as its main proponent admits, remains "incomplete and tentative" (McCarthy and Buvac 1997: 14; see de Paiva 2003 for more problems related to formalisation). I shall merely point out at this stage that the notion of 'outer context' (i.e. c0 in McCarthy and Buvac 1997) can be used to represent the above-mentioned possibility of *jibun* referring to the speaker or author of an entire sentence.

References:


Clements, G. N. (1975). The logophoric pronoun in Ewe: its role in discourse. *Journal of West African Languages* 10.2: 141-177.

Hagege, C. (1974) Les pronoms logophoriques. *Bulletin de la Societe de Linguistique de Paris* 69: 287-310.

Kameyama, M (1984) Subjective/logophoric bound anaphora *zibun*. *CLS 20*, 228-238.

Kuno, S. (1978) Danwa no Bunpoo (Discourse Grammar). Tokyo: Taishuukan.

Kuno, S. and E Kaburaki (1977). Empathy and syntax. *Linguistic Inquiry* 8: 627-672.

McCarthy, J. (1983). Notes on formalizing context. In *IJCAI-93*, 55-560.

McCarthy, J. (1996). A logical AI approach to context. MS. Stanford University.

McCarthy, J. and S. Buvac (1997). Formalizing context (Expanded notes). In A. Aliseda *et al*. (eds.) *Computing Natural Language*. Stanford, CA: CSLI Publications, pp. 13-50.

de Paiva, Valeria (2003). Natural deduction and context as (constructive) modality. MS. PARC.

# On the Properties of a Semantics-Pragmatics Interface Pattern in the Expression of Manner

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The aim of this paper is to describe the interface properties of a cross-linguistic pattern in the expression of Manner as instantiated in English and Spanish. I claim that these properties are motivated in the interdependence between lexical semantics and pragmatic principles. Certain semantics classes of verbs do not encode Manner, which is nonetheless communicated in utterances by R-implicating it using prototypical information regarding events and participants. Finally, I also show that there is a systematic linkage between the overt expression of Manner and the Information Structure Configuration of sentences containing verbs semantically underspecified for Manner.

The meaning of causative verbs has been described in terms of semantic representations containing two subeventuality variables –or predicates that can be interpreted as event denoting functions- (inter alia Dowty (1979), Levin and Rappaport (1998, 2001)). For example, sentence (1) involves (external) causality as a relation between a causing eventuality and a caused event (i.e. change of state) or Effect.

(1) The hunter killed the deer.

The semantics of this class of verbs have been represented in the lexicon as a structure involving two eventualities (i.e. $e_1$ and $e_2$) related by a causal relationship.

(2) CAUSE (**do’**(x,$e_1$), (BECOME **dead’**(y,$s_1$),$e_2$), e)

This representation makes apparent an asymmetric weight of information in the lexical entries of (most) causative verbs in English and Spanish (as opposed to, for example, Mandarin (cf. VanValin and LaPolla 1997)). In particular, the Result state –i.e. the final state of the Effect- is specified in relation to a property of its participant whereas the causing eventuality is not. According to (2), the verb ‘kill’ contains the presence of ‘i’ a Participant involved in an eventuality $e_1$ that causes a change of state (i.e. a killer/Agent); ‘ii’, a change of state $e_2$ in another Participant (i.e. killee or Patient); and, ‘iii’ a final state $s_1$ or Result such that the Patient is dead. This property assigned to the Patient in the Result is an independent specification that is not predictable solely from the thematic relation of Patient (i.e. being a Patient does not entail being dead). In contrast, no property of the causing eventuality is specified beyond the thematic relation of the participant; crucially, there are different ways in which this eventuality could have taken place but this is left undetermined. Let’s include this information under the large category Means, a subcategory of Manner, which denotes overlapping events in the same causal chain. Hence, causative’ verbs are typically vague in relation to Manner/Means.

I argue that the asymmetric treatment of Manner and Effect is not an accident, but rather follows from a pattern that is consistent with the principle of Minimization

(Levinson 1987). In short, I argue that Manner in (1) is not said because it is nevertheless communicated; that is, 'kill' in (1) really means (3):

(3) The hunter killed the deer by shooting it.

More specifically, my claim is that Means/Manner is an R-based implicature (Horn 1984) or I-implicature (Levinson 1987, 2000). Horn (1984) and Levinson (2000) have shown that entities that are entailed but left unspecified are filled in with prototypes/defaults. This general principle applies to (1); the existence of a causing event is entailed but unspecified and, thus, interpreted as a prototype in the following way: 'shooting' is the prototypical way in which 'hunters' kill animals and is not an atypical way of 'killing a deer'.

The interplay between lexical encoding and communicated information represented by (most) causative verbs such as the one in (1) is rather restricted in English (Talmy 1985, 2000). Moving away from causality into Locative Motion, English behave differently since it tends to encode Means/Manner lexically; what is left unspecified is the final state, which may be introduced by a prepositional adjunct.

(4).John walked into his office.

Sentence (4) entails a Theme/Figure moving along a bounded Path in a specific way. The semantic contribution of the verb is restricted to the thematic relation of the participant, a (un)bounded Path and the Motion relation plus the Manner in which this motion took place (i.e. rising and moving forward synchronically one foot after the other). Therefore, Manner cannot be an implicature in (4) since it is lexically encoded. In contrast, the same event is represented differently by the subtype 'Complement' of the Spanish Gerund Construction ($SGC_C$) illustrated in (5).

(5) Juan entró a su oficina.
Juan entered to his office
'Juan walked into his office'

The main verb *entrar* conveys a Figure, a bounded Path ending in an enclosure of some sort, and a Motion relation. There is no explicit information about Manner of Motion; however, it is meant that Juan walked via an R-based implicature drawn from the following premises: 'i' Human Locative Motion typically involves walking and 'ii' Juan is human. In consequence, (5) really means (6).

(6) Juan entró a su oficina caminando.
Juan entered to his office walking
'Juan walked into his office'

Therefore, the following generalizations can be drawn from an analysis of (1) and (5):

(7) a. In different languages, some semantic classes (e.g. causative and Motion) of verbs may contain events that are largely unspecified in relation to Manner.

b. Those entries can constitute two kinds of expressions: weak expressions -such as (1) and (5)- that leave the unspecified eventuality as it comes from the lexicon, and stronger ones -like (3) and (6)- that describe Manner by adding lexical material through syntactic means. The latter are stronger because they unilaterally entail the former ones and, in consequence, (3) and (6) constitute stronger assertions.

(i) The hunter killed the deer by shooting it. _The hunter killed the deer

(ii) Juan entró a su oficina caminando. _ Juan entró a su oficina.
Juan entered to his office walking Juan entered to his office
'Juan walked into his office' 'Juan walked into his office'

c. The weaker assertions –i.e. (1) and (5)- R-implicates the stronger ones, respectively, through a prototypical reading of the event description in the weaker expressions.

In addition, Manner is only expressed in this pattern if it cancels out the R-based implicature; that is, if the event was not performed as expected given the relevant background knowledge. For example, sentence (8) is perfectly natural.

(8) Juan entró a la habitación gateando.
Juan entered to the room crawling
'Juan crawled into the room'

In this paper I try to make a further claim: I argue that there are semantic conditions in what information can be R-implicated. Resultative Constructions (RC) – for example the English RC- share structural and semantic properties with $SGC_C$. Structurally, both constructions are Secondary Predicate structures; semantically, each construction contains two predicative expressions associated with different subeventualities that constitute a complex event. However, the secondary predicate in RC does not cancel out an implicature, there is not a prototypical outcome for the main event (there may be a 'natural' outcome Wechsler 1997). For example, in sentence (9) below, there is no implication about the final state of the animal.

(9) The hunter shot the deer.

The speaker who utters (9) does not implicate that the animal is dead and, consequently, the predicate 'dead' in (10) does not cancel out an implicature.

(10) The hunter shot the deer dead.

Despite their structural similarities, there is a clear semantic distinction between (1) or (5) and (9). Sentence (1) and (5) specify the Result and are vague in relation to Means/Manner; in contrast, (9) specifies Means/Manner and leaves the Result unspecified. This distinction has a pragmatic correlate: only Means/Manner but not Result can be implicated. I argue that this different pragmatic behavior is motivated in the fact that Manner involves a event overlap relationship, whereas Result involves event contiguity (the resulting state is added contiguous to the causing event). In Means/Manner two events – e.g. the entering event $e_M$ and the walking event $e_G$ in (6)- that share a subevent $e_Z$ such that $e_Z$ is a subpart of $e_M$ and $e_G$. Hence, Means does not add a new 'link' to the causal chain –which was already introduced by $e_M$-, whereas Result does. In consequence, I conclude that overlap is a relation between events that allows for implicatures, whereas event contiguity does not.

I should make clear that the claim is not that every event description with a causative verb is associated with a Manner implicature. For example, in sentence (11)

(11) Peter broke the glass.

there is no prototypical behavior associated with John in relation to a breaking-a-glass event that we can use as a Manner implicature. The description presented so far, however, only presents what makes an Implicature 'possible' (as opposed to 'necessary').

The interface pattern in the expression of Means/Manner contains also systematic correlations with Information Structure (Roth 1996, Lambrecht 1994). The basic fact is that a constituent expressing Manner in those instances is the unmarked Focus of the sentence. 'Focus sensitive' operators such as 'negation' and event quantifiers -standard tests for Focus- can attest to that intuition.

(12) Juan no entró a su oficina gateando.
Juan not entered to his office crawling
'Juan didn't crawl into his office'

The interpretation of sentence (12) –with an unmarked intonation- is that 'Juan' did enter his office, but he didn't crawl into it; thus, what is negated is the gerund phrase (GP) rather than the main verb phrase. Since negation has scope over Focus, this is the status that corresponds to GP. The same conclusion is attained by looking at the interpretation of the universal event quantifier in (13), which takes the presupposition as Restriction –which is, hence, affected with universal force- and the Focus as Scope.

(13) Juan siempre entra a su oficina gateando.
Juan always enters to his office crawling
'Juan always crawls into his office'

The main verb phrase is affected with universal force; namely, every event of Juan entering his office is part of the assertion, whereas not necessarily every crawling event by Juan is. Therefore, the interpretation of (12) and (13) are predicted if it is assumed that GP is the (default) Focus of the sentence.

The Focus status of GP cannot merely be derived from the linking of Information Structure and a broad description of the syntactic properties of the constructions. Other adverbial-adjunct-optional clauses –e.g. Adverbial Temporal Construction (ATC)- display the opposite Information Structure configuration; namely, embedded adverbial clauses are typically presupposed whereas main clauses are Focus. In sentence (14), negation has scope over the main clause, but not over the embedded one (just the opposite pattern attested in (12)).

(14) Juan no aborda el tren cuando hacen el primer llamado.
Juan not board the train when do-they the first call
'Juan doesn't board the train in the first call'

Further, the quantifier in sentence (15) affects with universal force the embedded clause (hence, Restriction), whereas the main clause is taken as Scope.

(15) Juan siempre viene cuando su madre lo llama.
Juan always comes when his mother him call
'Juan always comes when his mother calls him'

Is there any motivation for this Information Structure Configuration in which GPs are Focus? I argue that three interrelated conditions induce this linkage:

'i' The information presented by GP is contrastive in that it cancels out an implicature and, hence, it is maximally informative (it modifies the knowledge state of the hearer).

'ii' Borgonovo and Edleman (2002) and Paris (2001, 2003) have treated GPs differently from typical adjunct clauses (e.g. when-clauses) in that GPs are reduced clause structures.

The extractions that GPs allow are not possible for adjunct clauses; it is typically assumed that only complement clauses allow structures like (16) and (17).

(16) What did John come home singing?

(17) Qué vino cantando Juan?
What came singing Juan
What did Juan come (home) singing?

As opposed to bi-clausal structure, this syntax allows the embedded phrase to be Focus.

'iii' Finally, the category Manner/Means as an event relation denotes two overlapping events (namely, the main event $e_M$ and the embedded event $e_G$ share the subevent $e_Z$) and an asymmetry condition on their respective event descriptions -$\delta(e_M)$ and $\delta(e_G)$- such that $\delta(e_G)$ is more specific about the shared subevent $e_Z$ than $\delta(e_M)$. In (8), $\delta(e_M)$ and $\delta(e_G)$ introduces the same Theme, Path, and Motion relation that correspond to the shared subevent $e_Z$. However, $\delta(e_G)$ specifies the Means of the Motion relation in $e_Z$ and, hence, it is more specific since the only information in $\delta(e_M)$ that is absent $\delta(e_G)$ –namely, the boundary of the Path- does not describes $e_Z$.

I argue that the semantics-pragmatics interface is sensitive to this semantic asymmetry in information weight such that the more specific event description (i.e. the one that presents Manner) is associated with Focus whereas the other description with Presupposition; in consequence, we predict that GP is the unmarked Focus. A piece of evidence that supports this claim comes from the analysis of sentence (18) and (19) below.

(18) El tenor canta gritando.
The tenor sings screaming
'The tenor scream when he sings'

(19) # El tenor grita cantando.
The tenor screams singing
'The tenor screams when he sings' (intended meaning)

Both event descriptions denote a sound emission event; the singing event description left unspecified the loudness of the sound and this information is contributed by the screaming event description. From this we would intuitively predict that 'to sing screaming' is a way of singing but 'to scream singing' is not a way of screaming. This is confirmed by the semantic oddity of (19).

The linkage instantiated by (18) does not lie in a (broad) syntactic configuration. The same verbs under a comparable semantic relation has to be expressed with the reversed syntax just to maintain –I argue- the semantics-information structure mapping constant. Let's look at the 'when' ATC.

(20) El tenor grita cuando canta.
The tenor screams when sings
'The tenor scream when he sings'

(21) #El tenor canta cuando grita.
The tenor sings when screams-he
'The tenor scream when he sings' (intended meaning)

As shown before in (14) and (15) the embedded clause in ATC –in contrast to $SGC_C$- is presupposed; hence, the more specific event description has to be expressed in the main clause in (20) in order to maintain the cross-constructional linkage ‘more specific information-Focus’.

In conclusion, I have shown that Manner/Means is an R-based implicature in utterance containing verbs belonging to specific semantic classes; namely, verbs that contain a lexical semantics underspecified for Means/Manner. I have also shown that this Semantics-Pragmatics pattern depends upon the satisfaction of a semantic constraint requiring overlapping events. Finally, I have argued that this interface pattern is also characterized by a systematic link between Means and Focus.

References:


Borgonovo, Claudia and Ad Neeleman. 2000. Transparent Adjuncts. *Canadian Journal of Linguistics* 45 (3/4):199-224.

Horn, Larry . 1984. Toward a new taxonomy of pragmatic inference. Deborah Schiffrin (ed.) Meaning, Form, and Use in Context: Linguistic Applications. Washington: Georgetown University Press.

Levinson, Stephen. 2000. Presumptive Meanings. Massachusetts: MIT Press.

___________ 1987a. Minimization and Conversational Inference. Jef Verschueren and Marcella Bertuccelli-Papi (ed.). *The Pragmatic Perspective*. Amsterdam: Benjamins.

París, Luis. 2003. Grammatical encoding of event relations: Gerund Phrases in Spanish. Unpublished Dissertation, University at Buffalo, SUNY.

Rappaport-Hovav, Malka and Beth Levin. 2001. An Event Structure Account of English Resultatives. *Language* 77(4): 766-797.

Talmy, Leonard. 2000. *Toward a Cognitive Semantics*. Cambridge, MA: MIT Press.

# General Number and the Semantics and Pragmatics of Indefinite Bare Nouns in Mandarin Chinese

**1. Introduction.** Recent discussions of the semantics of number in Mandarin Chinese have focused on the absence of a mass/count distinction and the role of the numeral classifier in making nouns 'countable' (Krifka 1995, Chierchia 1998a,b). This paper discusses a related aspect of nominal semantics in Mandarin, namely the semantic and pragmatic properties of indefinite bare nouns compared to those of full DPs. By bare nouns we mean nouns which lack any determiners or classifiers. More specifically, we focus on bare nouns with an indefinite interpretation. (Bare nouns in Mandarin can also have generic and definite interpretations, depending on various factors that do not concern us here; cf. Cheng and Sybesma 1999, Yang 2001). Our starting point is the observation that in Mandarin (as in many other languages) indefinite bare nouns are neutral (or unspecified) for number:

(1) Zuotian wo mai le shu.
yesterday I buy ASP book 'Yesterday, I bought one or more books.'

The bare noun *shu* 'book' in (1) is neither singular nor plural. Following Corbett (2000), we will say that it has GENERAL NUMBER. By contrast, in English nouns are always specified for number; that is, every occurrence of a noun is either singular or plural (except maybe in compounds such as *bookstore*). Although Mandarin is a language without inflectional number morphology on nouns, it is not the case that all noun phrases in the language are semantically numberless. In contrast to the bare noun in (1), the full DP *(yi) ben shu* '(one) classifier book' in (2) is semantically singular, and the full DP *yixie shu* 'some books' in (3) is semantically plural:

(2) Zuotian wo mai le (yi) ben shu.
yesterday I buy ASP one CL book. 'Yesterday, I bought a/one book.'

(3) Zuotian, wo mai le yixie shu.
yesterday, I buy ASP some book. 'Yesterday, I bought some books.'

One of the goals of this paper is to explicate the notion of general number. A second goal is to explore the semantic and pragmatic differences between indefinite bare nouns and indefinite full DPs. We will argue that bare nouns do not only differ from full DPs in the fact that they have general number, but also with respect to discourse anaphora, scalar implicatures, and scope. Our third goal is to give a theoretical account of these differences making use of Chung and Ladusaw's (ms., 2001) theory of restriction and saturation as two different "modes of combination".

**2. Bare nouns are not ambiguous in number.** The fact that a bare noun has general number does not mean that (1) is ambiguous between a singular reading 'Yesterday I bought a book' and a plural reading 'Yesterday I bought books.' Rather the sentence has a single meaning which in English can only be paraphrased by means of a more cumbersome circumlocution such as 'Yesterday I bought one or more books.' Evidence for this claim comes from traditional ambiguity tests. Mandarin has a construction that is the functional equivalent of VP deletion in English, which is illustrated in (4).

(4) Wo you tie fanwan. Yuehan ye you.
I have iron bowl. John also have
'I have (an) iron bowl(s). So does John.' or 'I have (a) steady job(s). So does John.'

This construction can be used as a test for ambiguity in the same way as VP deletion in English (Zwicky and Sadock 1975, Cruse 1986). The noun *tie fanwan* in (4) is ambiguous, meaning 'iron bowl' or 'steady job'. When the object is elided under identity in the second conjunct, the deleted phrase and its antecedent needs to have the same sense as its antecedent. As a result, the two-sentence discourse as a whole is only two-ways ambiguous, not four-ways. Applying this test for

ambiguity to bare nouns, we see that they are number neutral, rather than ambiguous. (5), for instance, is true if the speaker and John each bought one book, or if they each bought more than one book, but also if the speaker bought one book and John bought more than one, or vice versa.

(5) Zuotian wo mai le shu. Yuehan ye mai le.
Yesterday I buy ASP book. John also buy ASP.
'Yesterday I bought one or more books. So did John.'

When we compare (1) to its English counterpart (6), an important question arises.

(6) Yesterday I bought a book.

At least since Grice, it has generally been assumed that (6) is actually true if the speaker bought more than one book. The fact that, without further information, the hearer may conclude from (6) that the speaker did not buy more than one book is a conversational implicature rather than a logical entailment. But if (6) is true iff the speaker bought one or more books, then what exactly is the difference between (6) in which the noun is singular and its Mandarin counterpart (1) in which the noun has general number? We argue that although (1) and (6) have the same truth conditions, they clearly differ in meaning, as will become clear when we look at discourse anaphora and implicature.

**3. Discourse anaphora.** In English, a singular indefinite can only be referred back to by a singular pronoun, whereas a plural indefinite requires a plural pronoun:

(7) a. Yesterday I bought a book. I brought it/*them home with me.
b. Yesterday I bought (some) books. I brought them/*it home with me.

In Mandarin, an indefinite bare noun can be referred back to with either a singular or a plural overt pronoun, or with a null pronoun (indicated as ∅) which itself is unspecified for number:

(8) a. Zuotian wo yudao le tongshi. Wo quing ta/tamen chifan le.
Yesterday I meet ASP colleague. I invite {him,her}/them eat ASP
'Yesterday, I met one or more colleagues. I invited him/her/them to dinner.'
b. Zuotian wo mai le shu. Wo ba ta/tamen dai hui jia le.
yesterday I buy ASP book. I BA it/them bring back home ASP
'Yesterday, I bought one or more books. I brought it/them home.'
c. Zuotian wo mai le shu. Wo dai ∅ hui jia le.
yesterday I buy ASP book. I bring back home ASP
'Yesterday, I bought one or more books. I brought it/them home.'

This contrasts with singular indefinite DPs formed with *yi* 'one' plus a classifier or just a classifier. These can only be referred back to with the singular pronoun *ta* 'it' or with a null pronoun:

(9) a. Zuotian wo yudao le (yi) ge tongshi. Wo quing ta/*tamen chifan le.
Yesterday I meet ASP one CL colleague. I invite {him,her}/*them eat ASP
'Yesterday, I met one colleague. I invited him/her to dinner.'
b. Zuotian wo mai le (yi) ben shu. Wo ba ta/*tamen dai hui jia le.
yesterday I buy ASP one CL book. I BA it/*them bring back home ASP
'Yesterday, I bought one book. I brought it home.'
c. Zuotian wo mai le (yi) ben shu. Wo dai ∅ hui jia le.
yesterday I buy ASP one CL book. I bring back home ASP
'Yesterday, I bought one book. I brought it home.'

Conversely, DPs with *yixie* 'some' are semantically plural and require a zero or plural pronoun:

(10) a. Zuotian, wo yudao le yixie tongshi. Wo qing *ta/tamen chifan le.
yesterday, I meet ASP some colleague. I invite {*him,*her}/them eat ASP
'Yesterday, I met some colleagues. I invited them to dinner.'

b. Zuotian, wo mai le yixie shu. Wo ba *ta/tamen dai hui jia le
yesterday, I buy ASP some book. I BA *it/them bring back home ASP.
'Yesterday, I bought some books. I brought them home.'

c. Zuotian, wo mai le yixie shu. Wo dai ∅ hui jia le
yesterday, I buy ASP some book. I bring back home ASP.
'Yesterday, I bought some books. I brought them home.'

We see that although sentences containing an indefinite with general number may have the same truth conditions (or "static" semantics; Groenendijk and Stokhof 1990) as those with singular and plural indefinites, they differ in the effect they have on the discourse context (their "dynamic" semantics). Whereas singular indefinites introduce a singular discourse referent and plural indefinites introduce a plural discourse referent, indefinites with general number introduce a discourse referent that is itself number neutral.

**4. Conversational implicature**. Another non-truthconditional difference between indefinite bare nouns and singular indefinites is in conversational implicature. Singular indefinites trigger the scalar implicature that not more than one entity is involved, but this implicature is absent with bare nouns. Therefore, singular indefinites are compatible with expressions marking the cancellation of a scalar implicature such as *qishi* 'in fact' (cf. Horn 1972, 1989), but bare nouns are not:

(11) a. Zuotian wo mai le (yi)ben shu. Qishi, wo mai le wuben.
yesterday I buy Asp one-CL book. In fact, I buy Asp five-CL
'Yesterday I bought a book. In fact, I bought five'

b. # Zuotian wo mai le shu. Qishi, wo mai le wuben.
yesterday I buy ASP book. In fact, I buy ASP five-CL
'Yesterday I bought one or more books. In fact, I bought five'

Interestingly, Mandarin has another expression *zhunque de shuo* 'to be exact' which can be used to further specify the number of entities involved. This expression shows the opposite pattern from *qishi*: it is fine with bare nouns but is much less felicitous with singular or plural indefinites:

(12) a. # Zuotian wo mai le (yi) ben shu. Zhunque de shuo, wo mai le wu ben
yesterday I buy ASP one CL book exactly MOD say I buy ASP five CL
'Yesterday, I bought bought a book. To be exact, I bought five.'

b. Zuotian wo mai le shu. Zhunque de shuo, wo mai le wu ben
yesterday I buy ASP book exactly MOD say I buy ASP five CL
'Yesterday, I bought bought one or more books. To be exact, I bought five.'

Further evidence comes from the fact that metalinguistic negation (Horn 1989) of the scalar implicature 'not more than one' is possible with singular indefinites but not with bare nouns (and as (14) shows the same is true of English bare plurals):

(13) a. Zuotian wo bu (zhi) mai le yiben shu. Wo mai le wuben.
yesterday I not (just) buy Asp one-CL book. I buy Asp five-CL
'Yesterday, I didn't just buy one book. I bought five.'

b. # Zuotian wo bu (zhi) mai le shu. Wo mai le wuben.
yesterday I not (just) buy ASP book. I buy ASP five-CL.
'Yesterday, I didn't just buy one or more books. I bought five.'

(14) a. I didn't buy ONE/A book – I bought five.

b. # I didn't buy books – I bought five.

**5. Scope**. Carlson (1977) has demonstrated that English bare plurals always seem to take the narrowest possible scope, unlike indefinite full DPs, which may take either wide or narrow scope:

(15) a. Minnie wishes to talk with a young psychiatrist. (wide or narrow scope)
b. Minnie wishes to talk with young psychiatrists. (only narrow scope)

Sometimes a bare plural can even have narrower scope than an indefinite singular possibly can:

(16) a. # A dog was everywhere.
b. Dogs were everywhere.

These observations carry over to bare nouns in Mandarin, as do Carlson's other tests (Yang 2001):

(17) a. Mini xiang gen yige nianqing de xinlixuejia tantan. (wide or narrow scope)
Minnie wish with one-CL young MOD psychiatrist talk
'Minnie wishes to talk with a young psychiatrist'
b. Mini xiang gen nianqing de xinlixuejia tantan. (only narrow scope)
Minnie wish with young MOD psychiatrist talk
'Minnie wishes to talk with young psychiatrists'

(18) a. # Yizhi gou suichugejian.
one-CL dog everywhere 'A dog was everywhere.'
b. Gou suichugejian.
dog everywhere 'Dogs were everywhere'

**6. Theoretical implications**. There is a fundamental difference between Mandarin and English with respect to the denotation of morphologically unmarked nouns. In English, a singular noun denotes a set of atomic individuals, and the corresponding plural noun denotes the set of all non-atomic sums that can be formed from those individuals (Link 1983, and much subsequent work). In Mandarin, however, nouns by themselves are unspecified for number. In formal semantic terms this means that a noun in Mandarin denotes a set of atomic and non-atomic individuals that is closed under sum-formation (Chierchia 1998a,b). It is the functional elements of the DP, in particular the classifier and determiner, which pick out only atomic (singular) or only non-atomic (plural) members of the semi-lattice denoted by the noun. Thus whereas in English number is a property of both the noun and the DP, in Mandarin number is only a property of the DP.

This difference between Mandarin and English in the semantics of nouns ties in with assumptions we make about the syntactic status of bare nouns vis a vis full DPs. We assume that bare nouns are NPs; that is, they are maximal projections of the lexical head N without any functional projections "on top". (It should be noted that bare nouns can be modified by non-functional material such as adjectives. This means that they must be phrasal; it would therefore be more accurate to call them "bare NPs", but we will stick with the more entrenched and less theoretically loaded term "bare nouns".) In Mandarin then there are no number distinctions at the NP level; NPs have general number and their denotation is closed under sum formation.

To implement our analysis we make use of the theoretical framework recently proposed by Chung and Ladusaw (ms., 2001), henceforth Ch&L. (It should be noted however that the main points of our analysis could probably equally well be implemented in a neo-Carlsonian framework in which bare nouns refer to kinds (Carlson 1977, Chierchia 1998a,b).) Ch&L argue that there are two "modes of composition" for a verb and a nominal: saturation and restriction. (We use the term "nominal" for the verb's syntactic argument to remain neutral with respect to its syntactic category, DP or NP.) The nominal saturates a predicate if it fills one of its argument positions, thereby reducing the arity of the predicate by one. This is the standard mode of composition traditionally assumed. Ch&L propose there is another option: the argument may restrict the verb's argument position without saturating it. The still unsaturated argument position is subsequently closed off by means of existential closure. (Ch&L argue that in some languages the argument position may be saturated by a second nominal — an option which we assume is not available in Mandarin.)

We propose that the only mode of composition available to indefinite bare nouns (i.e. NPs) in Mandarin is restriction. All the NP contributes to the semantic composition is a predicate. It does not have any quantificational force of its own. The existential interpretation comes about through the operation of existential closure (presumably applying at the VP level). One consequence of this is that bare nouns cannot take wide scope over any other element in the sentence. Indefinite full DPs, on the other hand, combine with the verb through saturation, and they are able to take wide scope by the usual means, e.g. choice functions or quantifier raising (we do not take a stand here on the choice between these two options.) This difference accounts for the scope facts in section 5.

The absence of scalar implicatures with bare nouns also naturally falls out from our analysis. Scalar implicatures crucially depend on the existence of a Horn scale (Horn 1972, 1989), i.e. a series of lexical expressions ranked by semantic "strength" or informativeness. The speaker's choice of a given expression on the scale rather than a stronger expression implicates that the stronger expression does not apply, by the Maxim of Quantity. For the scalar implicature generated by indefinite DPs the Horn scale consists of numerals. We assume that the English indefinite article *a(n)* is just the unstressed version of the numeral *one*, and that in Mandarin the numeral *yi* 'one' may be deleted when unstressed. Both English DPs of the form '*a(n)* N' and Mandarin DPs of the form '*(yi)* CL N' therefore generate the implicature 'not more than one N'. By contrast, bare nouns lack a determiner altogether, so there is no relevant Horn scale of expressions indicating quantity and no scalar implicature can arise. The operation of existential closure which applies to bare nouns is inherent in the compositional interpretation process and does not depend on the presence or absence of a particular lexical item. Because the speaker in that case does not choose between lexical items of different semantic strength on a Horn scale, there can be no conversational implicature.

**References**

Carlson, G. N. 1977a. *Reference to Kinds in English*. Doctoral dissertation, University of Massachusetts, Amherst.
Carlson, G. N. 1977b. A Unified Analysis of the English Bare Plural. *Linguistics and Philosophy* 1: 413-457.
Cheng, L. and R. Sybesma 1999. Bare and Not-So-Bare Nouns and the Structure of NP. *Linguistic Inquiry* 30: 509-542.
Chierchia, G. 1998a. Plurality of Mass Nouns and the Notion of "Semantic Parameter." In *Events and Grammar*, ed. S. Rothstein, 53-103. Dordrecht: Kluwer.
Chierchia, Gennaro. 1998b. Reference to Kinds across Languages. *Natural Language Semantics* 6: 339-405.
Chung, S. and W. Ladusaw. 2001. *Restriction and Saturation*. Ms., UC Santa Cruz.
Corbett, G. G. 2000. *Number*. Cambridge: Cambridge University Press.
Cruse, D.A. 1986. *Lexical Semantics*. Cambridge: Cambridge University Press.
Groenendijk, J., and M. Stokhof. 1990. Dynamic Montague Grammar. In *Papers from the Second Symposium on Logic and Language*, ed. L. Kalman and L. Polos. Budapest: Akadémiai Kaidó.
Horn, L. 1972. *On the Semantic Properties of Logical Operators in English*. Ph.D. thesis, UCLA.
Horn, L. 1989. *A Natural History of Negation*. Chicago: Chicago University Press.
Krifka, M. 1995. Common Nouns: A Contrastive Analysis of Chinese and English. In *The Generic Book*, ed. G.N. Carlson and F.J. Pelletier, 398-411. Chicago: University of Chicago Press.
Link, G. 1983. The Logical Analysis of Plurals and Mass Terms. In *Meaning, Use, and Interpretation of Language*, ed. R. Bauerle, C. Schwarze, and A. von Stechow, 302-323. Berlin: de Gruyter.
Yang, R. 2001**.** *Common Nouns, Classifiers, and Quantification in Chinese.* Ph.D. diss. Rutgers.
Zwicky, A., and J. Sadock. 1975. Ambiguity Tests and How to Fail Them. In *Syntax and Semantics*, vol. 4, ed. J. Kimball, 1-36. New York: Academic Press.

## Information Dependency in Quantificational Subordination

The purpose of this paper is to show that the received view of the problem of quantificational subordination is incorrect, and that, consequently, existing solutions do not succeed in explaining the facts. On the received view within dynamic semantic frameworks, the determiners treated as universal quantifiers such as *all, every*, and *each* behave as barriers to intersentential anaphora, yet allow anaphoric accessibility in a number of situations. We will term such determiners 'universal determiners' in what follows. Two basic approaches to these situations can be found in the literature. The first accepts that these logical operators are intrinsically barriers to anaphora, adding extra machinery (e.g. antecedent accommodation in Roberts 1989, 1996) to extract information from under the operators in cases in which anaphora is possible. The second denies that these operators are in fact anaphora barriers, and reconstructs their semantics so that information in their scope can be released, as in Kibble 1996. In this paper, we consider quantificational subordination as a test case. We adopt the second approach outlined above and propose a formalism for determiners that can account for the release of information necessary for anaphora (section 2). We further argue that subordination is not a unified phenomenon, and that in order to make distinctions between different types of quantificational subordination, a mechanism for *information attachment* is required; in our theory, this mechanism is based on accounts of rhetorical relations in SDRT (Segmented Discourse Representation Theory; cf. Asher 1993 and Asher & Lascarides 2003); the account is presented in section 3. Finally, in section 4, we discuss some implications of this approach for subordination involving modals.

### 1. Quantificational Subordination De-Generalized

The following discourses exemplify the phenomenon of quantificational subordination. In discourses like these, pronouns can access information introduced under the scope of determiners like *every* and *each*, contrary to the predictions of (classical) dynamic theories like DRT.

(1) a. Every hunter that saw *a deer* shot *it*.
b. *It* died immediately.
c. * *It* was a female.
d. * *He* intended to kill *it*.

(2) a. *Each man* loves a woman.
b. { *They* send / *He* sends } her flowers.

(3) a. *Every chess* set comes with a spare pawn. (B. Partee, in Roberts 1987)
b. *It* is taped to the top of the box.

On approaches of the first type (e.g. Roberts 1989, 1996; Frank 1997; Geurts 1999; Poesio & Zucchi 1992), the felicity of discourse subordination between two informational constituents is tied to the availability of a mechanism which extracts information from the first constituent and interprets the second with respect to that information. Such a mechanism is assumed to operate in cases like those above, so that anaphora becomes possible despite assumptions about the anaphora-blocking nature of the first quantifier; it is further assumed that this mechanism is fully general and applies equally to instances of quantificational, modal, and conditional subordination.

However, such accounts encounter several difficulties. In general, they are too liberal in their predictions. For example, according to Roberts (1989) and (1996), (1a,b) receives an interpretation consistent with the conditional rephrasing *if a hunter shot a deer then it died immediately.* The mechanism inducing this interpretation, however, also allows the following reading of (1a,d): *if a hunter shot a deer then he intended to kill it.* The possibility of this interpretation incorrectly predicts discourse (1a,d) to be felicitous. The Roberts-style theories, then, overgenerate in cases like these. In an attempt to deal with this problem, most researchers working with this sort of

account assume the existence of constraints on the extraction mechanism; however, spelling out such constraints has proved to be a non-trivial task.

A more detailed diagnosis of the problem is the following. Proponents of the Roberts-style approach make one crucial assumption that turns out to be at the root of many of the observed problems, including that discussed above: that discourse subordination is a unified phenomenon. In fact, as we show below, this assumption is not correct. Examining why this is so gives substantial insight into the nature of discourse subordination and is the first step on the road to a true solution.

Let us begin by considering a case of conditional subordination:

(4) If a person goes to school, he will learn some new things. # He's a pretty smart guy.

We are interested in the reading of the conditional in (4) on which the pronoun *he* does not refer to a particular individual, but rather to the nonspecific object introduced in the antecedent. We use the term *proxy information* for information subsumed within the scope of a semantic operator in this manner, to bring out the idea that such information is restricted to the operator domain. As shown by the infelicity of continuing the discourse in (4), the standard dynamic formulation of conditionals as inducing this proxy quality on their content seems to be correct.

Now, however, let us reconsider the quantificational subordination cases. In both DPL and DRT, the interpretation of universal determiners exploit the semantics of conditionals; thus, information introduced under universal determiners turns out to be proxy information which cannot escape the universal domain. As a result, universal determiners serve as anaphora barriers in DRT and DPL. Because of this analysis, the problem of quantification subordination seems to be the same as the problem of making use of proxy information. However, the examination of natural language data makes the idea that sentences like *every student goes to school* provide only proxy information appear to be false. Anaphoric dependence is available relatively unrestrictedly to objects introduced by universal determiners, as in the following examples:

(5) a. All men love a woman. They send her flowers.
    b. Every man loves a woman. They send her flowers.

We argue that the cases of quantificational subordination involving *each*, such as (2), function in a similar manner. And obviously, the first approach dees not have an easy way to explain the straightforward cases in (5).

For similar reasons, the example (6) does not depend on the manner in which the pronouns in (6b) are able to access the 'proxy' information in (6a), but rather on how the information introduced by (6a) can be updated by continuing the discourse with (6b).

(6) a. *Each degree* candidate walked to the stage. (Sells 1985)
    b. *He* took his diploma from the dean and returned to his seat.

On this account, the problem does not lie in the nature of the mechanism that accounts for anaphora out of quantificational contexts, but in the kind of semantic objects that are introduced by such contexts, and in the kinds of objects can then depend on them for their meaning.

However, the problem of proxy information seems to reappear in certain situations, for instance in the discourses in (1). Here, the information introduced by *a deer* in (1a) truly seems to be temporary; it has no specific reading. Nonetheless, this information is available to the pronoun in (1b) despite its proxy status; but such is not the case for (1c). The notion of proxy information seems to be needed here, as well as some way of restricting access to it. We will argue that these needs are satisfied by the mechanisms of discourse subordination through rhetorical relations implemented in SDRT. Before doing so, however, we introduce our formalism for inducing release of the correct information from universal determiners.

**2. Formalism**

Part of the formalism is defined by the following. The language of our formalism resembles a version of DPL extended with the operators $j^{Dep}$ and $j^{S-Dep}$, which are used to model possible dependency relations to objects introduced within universal determiners. A model $M$ is defined as a pair, $M =< D, I >$, that $D$ is a non-empty set of objects and $I$ is an interpretation function. For a constant $c_j$, $I(c_j) \in D$. For a n-place predicate $P^n$, we define $I(P^n) \subseteq (D \cup \wp(D))^n$. For an assignment function $g$, $g : (V \cup C) \rightarrow D$ that $V$ is the set of variables and $C$ is the set of constants and $g(c_i) = I(c_i)$. An information state $S_F = \{< g, f_g > \mid g \in S \text{ and } S \subseteq \$\}$ in which \$ is the set of assignment function, and $f_g$ is a function defined related to $S$ and $g$, $f_g : V \rightarrow (\$ \cup \wp(\$)) \times (D \cup \wp(D))$. $f_g$ is a function which records dependency and assignment information, and for the projection function $\mu$, for any any $g_j$, $t_i$, $\mu^1(f_{g_j}(t_i)) \neq \emptyset$, $g_j \in \mu^1((f_{g_j}(t_i))$. For the collection function, $\delta(\mu^1(f_{g_j}(t_i))) = \{g_h(t_i) | g_h \in \mu^1(f_{g_j}(t_i))\}$ if $F$ $(f_{g_j}(t_i() \neq g_j(t_i)$. $\}_j(t_i$ T3 TD[(and)]TJ/F5
*any*

## 3. Information and Coherence in Quantificational Subordination

Our analysis of quantificational subordination is based on two factors, as discussed above: compatibility conditions between the output of various universal determiners and pronouns, and the inference of rhetorical relations between discourse segments. The first part of the analysis corresponds to the formalism presented in section 2; the second part will be introduced shortly.

The first part of the analysis can be summarized as follows. The universal determiners *all, every*, and *each* are not intrinsically barriers to anaphora; however, the (dynamic) procedure by which they are processed outputs objects that are intrinsically singular or plural, meaning that only pronouns of the correct type are able to pick them up as antecedents. For instance, in (7), shown paired with their corresponding logical forms, both *all* and *each* output plural objects from the restrictor position, which plural pronouns may pick up; however, the singular nature of the nuclear position in (7a) and the presence of the 'jump' operator $j^{Dep}$ in (7b) makes the object information accessible to a singular pronoun.

(7) a. All men love a woman. They send her (*them) flowers.
$\exists x; all_x(man(x)); \exists y; a_y(woman(y)); love(x,y); plural(x); singular(y); send(x,y)$
$\exists x; all_x(man(x)); \exists y; a_y(woman(y)); love(x,y); plural(x); {}^*plural(y); send(x,y)$

b. Each man loves a woman. They send her flowers.
$\exists x; all_x(man(x)); j^{Dep}(x,y); \exists y; a_y(woman(y)); love(x,y); plural(x); singular(y); send(x,y)$

Thus, from the perspective of transitional information processing, the universal determiners *every* and *each* are ambiguous, and create different situations for anaphoric dependence on each reading.

Similar facts hold for the basic cases of telescoping subordination (8). Here, again, the possibility of anaphoric dependence falls directly out from our formalism; the object output by the universal determiner in the first sentence is of the right sort for the pronoun to pick up, and anaphora is possible without stipulating any additional machinery.[1]

(8) a. *Each student* in the syntax class was accused of cheating on the exam.
$\exists x; all_x(\text{student_in_the_syntax_class}\ (x)); j^{S-Dep}(x,x);\ \text{was_accused_of_cheating}\ (x)$.

b. *He* was reprimanded by the dean. (Fodor & Sag 1982)
$singular(x);\text{was_reprimanded_by_the_dean}\ (x)$.

Similarly, the infelicitous instances in (9) fall out of the inability of *every* to provide a object of the right sort to serve as antecedent to a singular pronoun.

(9) a. ?? *Every dog* came in. *It* lay down under the sofa. (Poesio & Zucchi 1992)

b. *If *every cat* purrs, *it* is happy. (Poesio & Zucchi 1992)

c. *John likes *every dog* and Sam feeds *it*. (Hornstein 1984)

The infelicity of (1a,d) can easily be explained by similar reasoning.

However, this cannot be the full story, for, as is well known, infelicitous examples exist that exhibit precisely the same structure as (8) in terms of determiner-pronoun matching, as in (10):

(10) a. *Each student* in the syntax class was accused of cheating on the exam.

b. **He* has a Ph.D. in astrophsyics.

On our account, the infelicity of (10) is not directly related to the problem of anaphoric accessibility. Rather, the difficulty is simply that the discourse is incoherent, i.e. there seems to be no

[1]From this perspective, the notorious variation in acceptability from speaker to speaker in examples like these is attributable to the nature of the conditions that allow anaphora. On our account, the 'jump' operators are used in the processing of sentences, but are not semantic *rules* in that they are not strictly obligatory. Because they are optional, and learned independently of the grammar, speakers may vary in their application of operators of this sort.

meaningful way to connect the two sentences. In SDRT terms, this translates as an inability to infer any discourse relation between the two segments. We spell this idea out formally for the similar case (1), the various segments of which are translated as follows in the formalism presented in section 2:

(1′) a. $\exists x; all_x(hunter(x)); j^{Dep}(x,y); D(((\exists y; deer(y); saw(x,y)) \rightarrow shot(x,y)))$
b. $singular(y); died_immediately(y)$
c. $singular(y); a_y(female(x))$

The theory of SDRT update (which includes a theory of discourse attachment, of which space considerations preclude a detailed discussion) gives the following meaning to (1a,b). Here *Result* is a rhetorical relation which requires a causal relation between two bits of information:

(11) $\exists x; all_x(hunter(x)); j^{Dep}(x,y); D(((\exists y; deer(y); saw(x,y)) \rightarrow Result(shot(x,y), singular(y); died_immediately(y)))$

The above may be interpreted roughly as *For every hunter[1], in case that that hunter$_1$ saw a deer[2], he$_1$ shot it$_2$ and then caused it$_2$ to die immediately*, which is intuitively correct. For (1a,c), however, no rhetorical relation can be inferred since the necessary background for this inference is lacking (with additional context, however, such an inference may be forthcoming, improving the discourse). Thus, the following coherent logical form cannot be constructed for any relation $R$ for (1a,c):

(12) $^*\exists x; all_x(hunter(x)); j^{Dep}(x,y); D(((\exists y; deer(y); saw(x,y)) \rightarrow R(shot(x,y), singular(y); a_y(female(y)))$

Similar facts hold for (10), explaining its infelicity.

Thus, on our account, the infelicity of the impossible cases of telescoping follow directly from independently necessary constraints on the coherence of discourse, not from any *ad hoc* constraints that must be defined on the availability of special update mechanisms. This account is related to, but not identical with, the script-based account of Poesio & Zucchi (1992); unlike them, however, our analysis is not specific to quantificational subordination, but falls out of general pragmatic constraints on possible discourses. Our analysis also incorporates a distinction between the information released by various universal quantifiers, which is overlooked in their analysis.

## 4. Discourse Subordination Re-Generalized

The account presented here can be generalized to other kinds of discourse subordination. In quantificational subordination, licensing depends on compatibility between the object introduced by a universal quantifier and the pronoun which depends on it. Abstracting away from the quantificational case, subordination comes with a compatibility requirement between a dependent object and its antecedent. In the modal domain, this requirement corresponds to a need for the domains of modal operators to 'fit' one another. In the literature, it has been noted that certain types of modality work together, and others do not:

(13) a. A wolf might come in. It would eat you first. (epistemic; subjunctive)
b. John should buy a car. He would drive it (deontic; subjunctive)

(14) a. A wolf will come in. # It would eat you first. (indicative; subjunctive)
b. John might buy a bottle of wine. # He should drink it. (epistemic; deontic)

In our terms, the felicity/infelicity of the above examples corresponds to the compatibility of the modal operators involved.

This observation itself is not new; scholars of modal subordination (Roberts, Frank, Geurts) have all noted it in one form or another. However, we think that our theory provides a new perspective on the facts by claiming that this need for compatibility is not limited to the modal case, but rather holds for all sorts of subordinating contexts. We also take the perspective that, parallel to the quantificational cases which are our main focus here, (a) modal operators are not anaphora barriers, and (b) anaphoric accessibility is also controlled by whether a discourse is coherent.